JOURNAL MISSOURI STATE MEDICAL ASSOCIATION

Volume VI OCTOBER, 1909. Number 4

ORIGINAL ARTICLES

FRACTURES: GENERAL CONSIDERATIONS.*

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This subject being of such magnitude, I will, in this paper, endeavor to deal only with the more important practical points in general, with a few remarks concerning the treatment of fractures of the hip. A most important step in the treatment of fractures is that one shall have made a proper diagnosis of the condition which he is about to treat; to undertake the treatment without an adequate impression in one's mind of the bony lesion present, detracts greatly from the satisfaction in one's work and conduces to poor results on the one hand, or to unnecessary confinement of the patient on the other. So important is this, that if one is not able to satisfy himself as to the character of the injury by use of the ordinary means of examination, the two artificial diagnostic aids should be called on, and either general anesthesia or the *x*-ray employed.

The general employment of anesthesia in the examination and the initial treatment of fracture, especially when near or involving joints, has made diagnosis more accurate and treatment more intelligent. The application of the *x*-ray to the diagnosis of fractures, has already contributed much toward an accurate interpretation of the physical signs of fracture. This greater certainty in diagnosis has suggested more direct and simple methods of treatment; antisepsis has opened to operative surgery a very profitable field in the treatment of fractures. The final results after the open incision of closed fractures emphasize the fact that anesthesia, antisepsis and the *x*-ray are making the knowledge of fractures more exact and their treatment less complicated.

*Read in the Medical Section, Fifty-second Annual Meeting of the Missouri State Medical Association, Jefferson City, May, 1909.

In stating what help the *x*-ray has been in increasing our knowledge of pathology and treatment of fractures, we may mention first some of the general points and then the particular fractures in which we find it to be a benefit. While surgeons have always realized very nearly accurately the position of the misplaced fragments in a common fracture, there can be no doubt that the production of pictures of the exact condition in individual cases gives more reliable information of the condition and relation of the broken ends than can possibly be obtained by palpation. A more definite knowledge of the pathology brings greater exactness of treatment. When the splints are applied it can be ascertained whether the position is good without removing the bandages. Little details that otherwise would escape knowledge are brought out. The patient is spared painful manipulation, or etherization and the bruising and laceration of the tissues from unnecessary handling. The question of the cutting operation to reduce otherwise intractable fragments may be decided by an exact knowledge of the position of the parts. This subject of the advisability of interference by making a simple fracture compound, is one that is attracting much attention, and will lead to its being made the rule in cases where a good result cannot be expected by the simple method. When asepsis can be practiced, there is little danger from making an incision, and the time saved where the approximation of the fragments is prevented by loose bits of bone or soft parts, is well worth this slight risk. At present we find the *x*-ray more assistance in the study of the pathology of fractures than we do in their treatment. An exact diagnosis of fracture without skiagraphs is open to doubt, while with a careful *x*-ray examination there is seldom a doubt.

In general those bones that can be brought nearer the plate or that are not over-shadowed by other bones, give the most satisfactory skiagraph; therefore little can be expected of skiagraphs of the bones of the head or vertebra, while bones of extremities come out with precision. The pelvic and shoulder bones stand midway between these, but with a good apparatus and care in the choice of the relative position of the plate, tube, and particular portion of the bone to be taken, we can expect a definite picture. Fractures in the shoulder joint, are often impossible to recognize without the *x*-ray, particularly in those cases where the swelling and effusion about the joint prevent manipulation. Fractures of the tuberosities of the humerus, of the surgical and anatomical necks can be differentiated with certainty. When separation and dislocation of the epiphysis have occurred the question of operation may be decided and the same question may be answered in those cases in which fractures of the neck have occurred without dislocation. Even in breaks of the shaft of the humerus and the other long bones we gain much information. The extent, direction and plane of cleavage with the exact amount of displacement are guides for the application of padding and splints. It is in fractures of long bones particularly that a second series of the skiagraphs with the splints in position is of value. The amount of short-

ening is shown more accurately than by measuring the land-marks; for the overlapping can be distinctly seen. We should not fall into the error of thinking that because the subject of fractures is one of the oldest branches of surgery and deals with the commonest of surgical lesions, it has obtained to its ultimate perfection. There is no doubt that some of the newer branches of abdominal surgery are more nearly perfected than is that of fractures, which has occupied therapeutic ingenuity since ancient times.

The doctor does well to think of a fracture as a wound of bone, which in its treatment and healing is amendable to the same rules that govern the healing of wounds in other parts of the body. The more widely the wound surfaces are separated, the greater is the damage to the blood and lymph channels and nerves. The more mobility the greater will be the exudate and swelling. Conversely the sooner and more accurately the wound surfaces are brought together and retained in apposition, the less will be the swelling, and more perfect the healing. We have not only to think of the wounded bone, but of the structures which lie in relation to it. The muscles play an important role; but muscular resistance is often regarded as the obstacle to reduction when the trouble is due really to the interposition between the bone ends of fascia, of a bundle of muscle, of a clot, or periosteal tissue which the *x*-ray does not reveal. When manipulation does not force such fractures from their entanglements, a satisfactory result is best secured by operation. Unless operated upon such fractures are apt to give delayed union or non-union. The term non-union does not however necessarily imply that no union exists between the bone, but simply that bony union does not exist. In cases of so-called non-union, fibrous union is often present. In cases of non-union a wide separation and imperfect immobilization of the fragments are factors in the occurrence. Of the general causes it is thought that syphilis, pregnancy, prolonged lactation, the wasting diseases, rachitis, and the acute febrile diseases, may contribute somewhat toward non-union. The constitutional treatment of non-union is no doubt of considerable importance, together with a complete reduction and absolute immobilization of the fragments. If these measures fail after a fair trial, a rubbing of the end of the fractured bones together and then immobilizing is sometimes effective. If this fails, operative measures should be instituted for making the fracture an open one for the removal of interposed tissues. There is considerable mis-construction of this question of non-union. We are taught much about constitutional weakness, old age, and lack of earthy salts in the blood; but these, I believe, are of secondary importance to the local condition just narrated. Broken bone surfaces held in close apposition, bone to bone, will grow together just as they do in fractures of the skull. Swelling is also an important consideration. It is due to exudation from the wounded bone surfaces and from its surrounding soft tissues, which are injured by bone fragments or by loss of support. We may count it as

a pretty general rule that the swelling is in direct proportion to the amount of mobility. The exudate of the bone itself amounts to but little, most of it being from the damaged blood channels of the neighboring soft tissues. There is a prevalent notion of waiting until the traumatic reaction has subsided, but there is traumatic reaction going on as long as the bones are out of place, or so long as they are movable. There is also a practice of deferring serious treatment until the swelling has gone down, but if we can only effect an immobilization soon enough, the swelling will not be great. The swelling in fractures of the skull is inconsiderable, notwithtsanding that the total area of bone surface involved, is ordinarily more than in fractures of the leg or arm, and the vascularity greater.

The reason for this is the natural immobility of fractures of the skull. It would, of course, be unwise to consider the treatment of fractures of the skull apart from a more or less systematic review of traumatic lesion of the brain. In case of fracture of the skull the injury to the brain is of paramount importance. The immediate danger to the brain may be caused by direct pressure of bony fragments, by bruising of the brain itself, or by cerebral edema. Great interest attaches to serious head injuries, not only because the brain may be damaged, but more especially because the lesions are often obscured by an intact scalp. A proper determination of the condition existing after a fracture of the skull necessitates careful observation of symptoms combined with good judgment in interpreting the signs present.

The sooner a fracture is reduced, its bony surface brought into apposition and held immovable, the less will be the swelling and the more satisfactory the results. In a great many hospitals, however, when a fresh fracture of the leg is brought in, it is put up temporarily in a vast amount of cotton in such a way that the bones are not immobilized. Swelling is expected and the expectation is fulfilled. After the muscles, tendon-sheaths and nerves have been infiltrated with exudate for several days, the serum is sufficiently absorbed for the leg to be properly immobilized. The practice should be to correct deformity and permanently immobilize such fractures at once. When the fracture is seen within the first few hours (2 to 10) there is usually little swelling present. The limb should receive a thin cotton covering with plaster of Paris dressing, applied immediately over this. It does not require a heavy covering with the plaster bandage to immobilize the fracture. It is important that the bandage next the cotton dressing be applied without folds, and with the most possible evenness, no reverses being made. A thin cast being applied in this manner conforms to the shape and contour of the leg, and allows of a comparison with the other limb. A good plan is to cut through this cast on either side so as to divide it into an anterior and posterior half. This can be done before the last bandage is applied, and while the plaster is still soft, by using a sharp knife or bandage scissors. Then the final bandage is put on. Later when the

cast is hard, if it is desired to inspect the leg, it is an easy matter to cut through the outer bandage, following the underline mark and lift off the front half of the splint. Dr. James P. Warbasse, of Brooklyn, says this operation is facilitated by drawing two long white cotton stockings over the leg and applying the plaster of Paris dressing over this. At the first cast cutting operation, dividing the outer stocking, which is adherent to the cast, and leaving the under stocking intact. While putting up a fracture immediately after its occurrence may not usually be regarded as good surgery, I believe it is, if the cast is well put on. If it is smoothly applied, and the apposition is good, there will be no further swelling, provided there are no extraordinary conditions present, such as imperfect reduction, rupture of large vessels, or venous obstruction.

After such immobilization the leg should be almost free from pain. There should be little throbbing or discomfort; if there is, the chances are the reduction is not good, and such a splint should not be left on in presence of much pain.

Another matter to which attention may properly be called, is the manner of extension in the fracture of a thigh. In the ordinary fractures about the middle third of the femur the over-riding of the fragments is considerable, and there is often a lack of appreciation of the amount of force required to overcome the muscular contraction and bring down the fragments into place. Under the best conditions there is rarely a complete correction of the over-riding. Fortunately most fractures of the shaft of the femur are oblique, and the broken bone surfaces slide over one another longitudinally, causing but little lateral displacement. When the fracture is transverse, the over-riding, of course, produces lateral displacement equal to the diameter of the bone; often more or less soft tissue interposes and the injury becomes a more serious thing. In order to overcome these longitudinal displacements in a man, an extension which is more than the patient can tolerate is necessary. Authors of text-books usually give from 10 to 20 lbs., but this is hardly ever sufficient. If the fracture is oblique, 20 to 30 lbs. may nearly correct the over-riding. If it is transverse that amount will not bring the bone ends into apposition, even with the use of a general anesthetic. The time to apply this extension to accomplish results, is immediately after the accident, every hour adding to the infiltration with serum, blood and leucocytes, of the connective tissue, fascia, and muscle, about the fracture, and diminishing the elasticity of these tissues. What can be done by 20 lbs. of traction in the first few hours, cannot be done by twice that weight after the third or fourth day. Dr. Stepson's proposition to tire out the muscle by traction does not work here; instead of relaxing the tissue becomes more resistant; still some begin with a moderate amount of extension, then after a few days, measure the legs and finding shortening, add five lbs., continuing to repeat this until at the end of a week or so, they get up to the amount of extension, which if applied on the first day would have probably brought the bones in apposition, but

which by the time it is applied is insufficient. The time to put on the maximum extension, is at the very first—20 to 40 lbs., in a man, then at the end of a few days, this extension can be reduced. The *x*-ray has shown that an accurate replacement of fragments is rare; it is unfortunate that the public often expects the impossible. When we secure a perfect functional result, we should not forget that a perfect functional result is compatible with an imperfect piece of jointing. In most of the complete fractures of the long bones of the leg the apposition is probably far from correct. The open operation is the only method by which they can be made absolutely correct; this is not often necessary, as a restoration of function is the thing we aim at, and we should disabuse the public mind of the idea that this requires exact apposition. Here is found one of the values and dangers of the *x*-ray; valuable to the doctor, and the patient for the help it affords in showing the condition of the bones, dangerous—sometimes to the doctor, and the patient for its misleading effect on the mind of the patient. Some one has said, if doctors would display as much zeal in discussing their imperfect results as they do in presenting their triumphs, our literature would be richer, more practical and of more value, and the public would be less apt to expect the impossible in the treatment of fractures.

Concerning fractures of the neck of the femur; this accident most frequently occurs in elderly people, is ordinarily associated with a very slight injury such as a trip and fall upon the floor from a standing position; perhaps in many instances the fracture precedes the fall, it is often difficult to determine the exact seat of the lesion. Whether the fracture is within or without the capsule of the joint is of comparatively little importance, on the other hand whether the fracture is impacted or unimpacted is of the greatest importance; fractures of the base of the neck of the bone—that is fractures near the trochanter, are usually impacted; fractures of the neck toward the head of the bone, unimpacted. Impacted fractures unite readily, unimpacted fractures often remain ununited. A prolonged search for crepitus and abnormal mobility should not be attempted. Slight shortening with a little deformity, some limitation in the movements of the hip, a limp, but a fairly useful limb are to be hoped for. It has been demonstrated conclusively, that the old time method of treatment of fracture of the neck of the femur is not productive of satisfactory results, that is traction and immobilization for periods varying from a few weeks to a few months, then allowing the patient to go about on crutches, no other treatment being used. Fractures of the hip or the neck of the femur, demand the greatest tact in their management; the patient should be placed upon a comfortable firm hair mattress, underneath the mattress crossing the bedstead from side to side, should be placed several wooden slats a few inches apart, these slats prevent sagging of the mattress and much consequent discomfort.

Great caution must be exercised that no sudden or forcible movements of the hip are made which might break up the impaction of the bone or cause unnecessary pain. The leg should be placed in as natural a position in extension as possible, the knee should be placed upon a pillow; a weight of about five pounds should be applied to the extension with the leg gently rotated and carefully placed approximately in normal position; the foot of the bed should be elevated to the height of about six inches, in order to secure counter-extension. Long and heavy sand bags should be placed on each side of the leg and thigh, to assist the light extension in affording support and to give a sense of security. The foot should be kept at a right angle with the leg; the patient should be kept quiet in bed for two weeks. Ordinarily the extension may be removed in the third week, the patient may then be removed to another bed. In this change the thigh should be supported by sand bags. From this time and during the next six months quite a number of different treatments are advocated by different authorities. I will briefly relate a case which two days ago I had the opportunity of inspecting and measuring, and I consider the result very good.

September 13, 1906, a boy aged 17, small for his age, and of not very vigorous health, fell through a sky-light to the floor about 20 feet below, sustaining a complete fracture of the neck of the left femur. After treatment somewhat as above related, for four or five weeks, he was allowed upon crutches, his leg placed in a brace extending from the foot to the pelvis, which exerted continuous traction upon the leg, the brace being worn for about three months, after which time it was removed, and he was allowed to go about upon the leg. There is between three-fourths of an inch and an inch shortening, and of course a limp, which is, however, only slight. There is good motion in the hip joint and the limb never bothers him in the least. This modification of the ambulatory treatment I believe is conducive to good results.

The Frank ambulatory treatment of fractures, of which medical literature contains many references, has been in use for about ten years, but has not met with general approval even among hospital surgeons. It is a radical method open to many criticisms, and I should be afraid to use it. It contains several important suggestions, however, and might prove interesting to follow the adoption of the method by its advocates, and to prove if possible what there is in it of permanent value.

Operation upon ununited fractures. In operating upon cases of ununited fractures, the refreshening of the ends of the fragments is a necessary step in the technique. Meyer in a case of ununited fracture with three inches shortening made the Langenbeck incision for excision of the hip joint, exposed the seat of fracture, scraped the ends of the fragments until they bled, reduced the deformity by extension of the limb and fastened them together by driving two nails through the trochanter major. A useful joint was obtained with an inch and a half shortening of the limb. Parkhill commends this method for fracture of

the neck of the femur. Gillette reports three cases of ununited fracture of the neck of the femur operated upon by him; there was union and good motion obtained in all the cases, with shortening of from an inch to an inch and a half. Curtis, in a case of fracture of the neck of the femur of three months' standing reports good union and a useful limb with three-quarters of an inch shortening after operation. Freeman reports 15 cases with one death and 14 recoveries with good functional results in all. There is yet reasonable doubt regarding the advisability of this operation except in special cases. The difficulty in securing and maintaining proper adjustment of the fragments because of the lack of command of the inner portion, its porous character, and low vitality, present obstacles to success that cannot be denied. The degree of shortening that follows successful results suggests an initial failure of reduction of the deformity or the maintenance in proper place, and bespeaks in any event a considerable amount of absorption at the seat of the fracture. A more extended experience is needed and a careful comparison of the favorable results by different methods of treatment is required before a final judgment can be rendered. In fact the treatment of the fractures of the neck of the femur, is gradually undergoing a change which may prove to be a very radical one.

ANÆSTHESIA.*

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In the present paper I wish to discuss the subject of general anæsthesia, with special reference to a consideration of the responsibility of the anæsthetist to the patient, to the surgeon and to the law. The subject is one of the most important in the domain of surgery, and vitally concerns the surgeon, for it is the anæsthesia which makes possible today his brilliant results.

That the subject is one for serious consideration is attested by the abundance of literature and discussion appearing every few months in the medical journals throughout the country, and by the recognition of the value of the specialist in anæsthesia in our larger medical centers.

The relation of the anæesthetist to the patient is one of grave responsibility. To him the patient entrusts his life in the trying ordeal of being carried safely through an anæsthesia. Every means possible should be taken to inspire the patient's confidence. The attitude of the patient toward the anæsthetist is usually one of doubt. Too often the anæsthetist is seen for the first time when he appears in the room to administer the anæsthetic. He is an unknown quantity. The physician is well known. The surgeon is famous, but the anæsthetist, who is next in importance to the surgeon, has never been mentioned until he is ushered into the patient's presence on the morning of the operation. This is wrong. Not only is it unjust to the patient, but it is unkind to the anæsthetist. The confidence of the patient in the anæsthetist goes a long way in allaying the fears of the ordeal through which he is to pass, and the surgeon can accomplish this by giving the patient every assurance of his faith in the responsibility and skill of the anæsthetist.

Some surgeons adopt the plan of having the patient consult the anæsthetist in order that a thorough examination of the heart, lungs, mouth, and nose may be made, and the patient's confidence gained through his care and attention to details. In this way the status of the anæsthetist is established. It is not at all uncommon to hear the patient express his dread of the anæsthesia more than the operation. For this reason every means should be taken to allay his fear. To what extent does the surgeon allay this fear, and obviate the dangers of a poorly administered anæsthesia when he tells the patient not to worry that he will attend to all that, and then calls upon some unskilled practitioner, or medical student, or nurse, to give the anæsthetic? The patient may not

*Read in the Surgical Section, Fifty-second Annual Meeting, Missouri State Medical Association, Jefferson City, May, 1909.

realize the difference at that time, but let it become necessary to take a second anæsthesia, has the patient forgotten the experience? If a woman, she will recall the horrible sense of suffocation, and the dreadful sickness which followed it for days. How long will it be before she has told all her friends and neighbors about her experience? The result is that the laity believe it is a frightful thing to take an anæsthetic, and that a deathly sickness is the inevitable result, when as a matter of fact, the reverse is the actual condition when the anæsthesia is administered by an expert.

So important has this branch of medicine become that patients are beginning to realize the difference between skilled and unskilled anæsthesia, and it is not uncommon for the patient to demand the services of an expert anæsthetist, or even to postpone the operation until the specialist can be obtained.

The relation of the anæsthetist and surgeon should be one of utmost harmony. Each is working not for himself, but for the ultimate good of the patient. Their separate fields are entirely distinct. The surgeon cannot supervise the anæsthesia, neither can the anæsthetist direct the operation. As the judgment of the surgeon must be final in regard to the operation, so the judgment of the anæsthetist should be final in regard to the anæsthesia. Neither one can act as dictator. The anæsthetist is not an assistant to the surgeon, but is present in a capacity entirely apart from that of the surgeon, more that of a consultant, and the sooner such a relation is recognized the better the interest of the patient will be served. Hewitt has admirably stated the case in the remark "that it not unfrequently happens in the surgery of to-day that the rôle played by the anæsthetist is of even greater importance than that played by the operator, and the time has come for a clear recognition of these two distinct responsibilities."

The surgeon may have been a good anæsthetist at one time, but when he allows his attention to be diverted from the operation, by the presence of an incompetent anæsthetist whom he has volunteered to supervise, he detracts just so much from the patient's chances. His attention is divided and he cannot give his best care to the patient for his responsibility is divided and increased. Neither is his judgment good in regard to the anæsthesia, because only the man at the head of the table knows the true condition of the patient, and many patients' chances for life have been vitiated by this necessity of supervision on the part of the surgeon over the inexperienced anæsthetist.

This statement is not one bit overdrawn. I have seen a surgeon irritate an inexperienced anæsthetist into so overdosing his patient that the patient died on the table. On leaving the room the surgeon remarked that he had always regarded ether as a safe anæsthetic. Think of it, one of the most powerful drugs in the pharmacopeia a safe one in the hands of the inexperienced!

I have very little patience with the surgeon who belittles the anæsthetist, or says any one can give an anæsthetic, for I feel he has not a proper conception of the agent which contributes in no small measure to his success.

When a man says any nurse can give an anæsthetic, he is beyond argument. Only ridicule is proper, and I will try to answer him with his own logic. I know of a negro janitor in one of our large city laboratories who for years stained and examined all the "T. B." and "K. L" specimens and left them marked on the chief's desk for confirmation, the diagnosis was usually correct, but would the gentleman also advocate that negro janitors be appointed to fill such positions? They can be trained to do it and it would be a great saving to the city.

I have asked for your serious consideration of this important subject. In the language of one of our greatest anæsthetists, I ask, "Is there not just as great a scope for professional skill and judgment when the respiratory, the circulatory, and the nervous functions of a patient are being profoundly modified by a general anæsthetic as there is during enteric fever or some other ailment, for which the services of experienced physicians are generally regarded as essential? Yet it often happens, not only in hospital but in private practice, that the safety of a patient during the most critical hour of his life is entrusted to the mercies of one who has had little, if any, scientific training, and whose acquaintance with the powerful drug he is handling bears an inverse ratio to the self-confidence displayed in their administration. This state of things is open to much criticism, and should certainly be remedied."

Is it any wonder that our English brothers find cause for comment on the fact that here in America where ether was discovered we have few specialists in anæsthesia, and scarcely a hospital in the country has an anæsthetist on its staff?

Who is to blame for this deplorable condition? Is it not the lack of encouragement of the specialty on the part of the surgeon? Every surgeon tries to give his patient the best there is in surgery, why not procure for him the best he can in anæsthesia, since the success of operations in general is influenced in no small measure by the degree of skill and care on the part of the anæsthetist?

The relation of the anæsthetist to the law seems to be based more or less on the English law covering the subject. Anæsthetics may be administered for the purposes of relieving distress, or the pain incident to surgical operations. When given with other intentions, such as illegal operations, robbery, or rape, the adminisrator then becomes liable under the law.

To avoid the appearane of crime, a third person should always be present throughout the administration of an anæsthetic to a female, since the erotic dreams incident to anæsthesia, upon a female, has resulted in many false charges being brought.

Who, in the eyes of the law, is qualified to give an anæsthetic?

Buxton, of England, states: "At the present time some uncertainty exists upon this point, owing to the discretionary power being left to the operator to assume the so-called responsibility of the anæsthesia. Thus, nurses, medical students, servants, and various unqualified persons have been permitted to give the anæsthetic, or keep it going, while the surgeon, besides operating, is supposed to exercise a general supervision over the administration. Were an action for damages raised upon a death occurring under the above named circumstances, there is little doubt that the surgeon proceeded against would be heavily mulcted, since nothing short of the utmost emergency could justify the proceeding."

Hewitt draws similar conclusions as to the law. He believes that the law should protect the individuals who innocently submit themselves to the most powerful drugs in the pharmacopeia at the hands of those who are utterly ignorant of the risk involved, and the responsibility in administering an anæsthetic should rest with the administrator and not as has been held, with the operator. He believes that legislative acts should be required restricting the administration of anæsthetics, save in the most exceptional circumstances, to duly qualified medical practitioners, and separating the responsibility of the anæsthetist from those of the operator.

In this country, the responsibility of administering an anæsthetic is very similar to the English law. In Hamilton's Medical Jurisprudence the law is stated as follows: "An anæsthetic should not be administered without an assistant except under circumstances of emergency. When the operator is compelled to accept the services of a non-professional person, he must take the entire responsibility of the administration. When the assistant administering the anæsthetic is a regular qualified practitioner, the responsibility from the professional standpoint should be shared by both. If, however, the operating surgeon can be justly accused of selecting an anæsthetist who has not had sufficient experience to enable him to give the anæsthetic properly, and was so engaged in the operation as to be unable to personally supervise the administration, then in case of accident, he could be held liable under the general rule."

As the law now stands, the question resolves itself into the question of negligence in case of death from the anæsthetic. Was the surgeon careful in his selection of the anæsthetist, and if he chose the anæsthetic, did de select the proper drug? Was the anæsthetic a proper one for the case? Was it pure, and was it properly administered?

In view of the fact that to administer an anæsthetic with the minimum risk to the patient is all that a properly qualified and experienced man can attend to, and since, as I have pointed out, the surgeon can only properly give attention to his share of the operation, it would seem reasonable that he should be absolved from any responsibility pertaining to the anæsthetic, and the responsibility placed where it belongs, upon the anæsthetist.

SOME LATE EFFECTS OF CHLOROFORM.*

By William W. Stevens, M. D., Kansas City, Mo.

This paper is a review and condensation of the literature, and while my subject is "Some Late Effects of Chloroform," I am going to consider only the late effect of chloroform on the liver and the resulting hepatic syndrome and pathology. I will endeavor to present the practical side of the subject, avoiding as far as possible the theoretical and disputed points, giving facts that all investigators have agreed upon. The most valuable part of this paper is the bibliography which I append and which those of you who are interested will have an opportunity of seeing when the paper is published.

By whatever name you wish to designate it, the late effect of chloroform on the liver is a pathologic entity with its own symptom complex, and as such we have to recognize it. Those of us who use chloroform, either occasionally or as a routine anæsthetic, are liable at any time to be called upon to face this condition and when once recognized it is indeed terrifying. It is a subject of much importance and as yet it has not been satisfactorily solved, particularly as to its successful treatment.

In 1850, Caspar expressed the belief that chloroform might be followed by a state of chronic poisoning which might end in death. Langenbeck, during the same year, reported a death from the supposed delayed action of chloroform. Guthrie, in 1862, said it was no longer doubted that there is such a thing as chronic poisoning by chloroform, that is, that the patient may die hours, days or even weeks after regaining consciousness.

The cases of delayed chloroform poisoning, described in the literature, apparently tend to group themselves into two classes. In one, which affects chiefly children, the symptoms are those of acidemia or acetonuria without jaundice, and in these cases the changes in the liver are not so marked, consisting chiefly of fatty degeneration about the periphery of the liver lobules. Beesley reports 17 appendectomies done upon children at the Royal Hospital for Sick Children, Edinburgh, with 14 deaths all exhibiting marked symptoms of acetonemia, and the autopsies revealed the characteristic wide-spread fatty degeneration. The other type is observed chiefly in young adults, and clinically is marked by profound jaundice, cholemia and the usual syndrome of a rapidly fatal acute yel-

*Read in the Surgical Section, Fifty-second Annual Meeting, Missouri State Medical Association, Jefferson City, May, 1909.

low atrophy of the liver. Intermediate cases occur that do not fall distinctly into either of the two types. The predisposing causes are: youth, sex; alcoholic, mercurial, lead, carbolic acid and iodoform intoxication; homesickness, fright, change of food, intestinal fermentation, extensive fatty changes associated with infantile paralysis, starvation, sepsis, pregnancy; the presence in the body of a dead fœtus or a gangrenous mass; diabetes, carcinoma, anemic states from any cause, hemorrhage, infections with pus germs, diphtheria, chronic diseases involving both kidney and liver, such as cirrhosis and nephritis, fatty degeneration of the liver and prolonged or repeated anæsthesias.

There is a marked similarity in the symptoms exhibited in all of the reported cases. The patient usually makes what is apparently a good recovery from the anesthetic, and seems to be doing well. Suddenly the marked cerebral symptoms appear; he becomes anxious, irrational, restless with sudden and great fright, piercing crys, shrieks, grinding of the teeth, tossing and struggling, delirium followed by apathy, and then coma; irregular or dilated pupils, tremor, the sweet acetone odor is present in the breath, vomiting of "coffee ground" vomitus, absence of fever until just before death, then it may reach 104 degrees; jaundice of varying degrees, flushed face, air hunger as shown by deep breathing and bright red mucous membranes, Cheyne-Stokes respiration, cold extremities, weak, rapid pulse, collapse and then death.

The autopsies done upon patients dying with the above symptoms after chloroform, almost invariably show the same macroscopical and microscopical changes, which are: pale and faun-colored liver, fatty degeneration or infiltration of the liver, the various changes of nephritis in the kidney, fatty degeneration of the heart and fatty degeneration of the muscles of the lower limbs. The most important of these are those found in the liver—fatty degeneration and necrosis of the liver cells; autolytic disintegration of the necrotic cells and fatty degeneration of the cells which are not necrotic. The capillaries and blood vessels do not seem to be involved, there is no thrombosis, and no inflammation or proliferative action. This condition is essentially an hepatic toxemia and the other changes are secondary in importance to those in the liver. The toxins producing the definite symptom complex which always accompanies this condition, are liver toxins produced as a result of the fatty degeneration and necrosis of the liver cells, or the failure of these cells to eliminate substances which they normally eliminate, but which under these abnormal conditions accummulate and produce toxic effects. Wells says, "Chloroform is a violent protoplasmic poison, and if it were to inhibit or destroy the oxydizing enzymes of the liver cells, the results would probably be the same as those characteristic of chloroform necrosis; hence it seems probable that chloroform produces its effects by acting on the oxydizing enzymes, without corresponding inhibition of the autolytic enzymes and lipase of the cell." I would like to ask is it not possible that here we have a condition similar to that in uremia? That is, is it

not possible that parts of these necrotic cells might gain entrance to the general circulation producing antibodies like the nephro-lysins in uremia?

Up to the present time the treatment of this condition has been extremely unsatisfactory, and the best treatment is entirely preventive; by avoiding prolonged or repeated anæsthesias (as these have always produced these changes in guinea pigs) and by preventing any excessive loss of blood; by substituting ether for chloroform in the presence of diabetes, sepsis, starvation (on account of the susceptibility to the acetone syndrome), fatty degeneration of all kinds and especially that of the liver and infantile paralysis; acute acetonuria, any liver lesion, intoxications from dead or gangrenous tissue; by using ether instead of chloroform for children for these little ones are far more susceptible than adults, and by always giving chloroform in combination with oxygen.

The previous administration of alkalies has been recommended when for any reason this condition is feared. But this treatment has not come up to expectation. Wilbur has proven that the pathological effects of acidosis are not wholly due to the withdrawal of alkali from the blood and most investigators are agreed that acetone, etc., are by-products and their symptomatology must be regarded as secondary to the hepatic. Beesley makes the point that these symptoms are not due to the formation of acetone but to the failure to excrete it. Hunter thinks that if instead of enforced abstention from food, the patient were given a very nutritious and easily digested meal, well sweetened, two or three hours before operation, that this condition would be entirely prevented. In the presence of the attack opinions differ; some recommend the exhibition of glucose; others, sodium bicarbonate. It seems to me that by promoting elimination through all of the avenues of excretion, stimulating the patient with normal saline solution to which adrenalin has been added, and the continuous or almost continuous administration of oxygen, we have done about all that can be done. Holt has proven that pure oxygen is a direct antidote to protoplasmic poisons and Offergeld found that chloroform, when given in combination with oxygen, did produce degenerative changes, but only to a limited degree and that regeneration began in a few days.

The prognosis is always unfavorable, the severe cases invariably ending in death, while some of the milder ones recover.

I wish to report a case which occurred in my practice some eight or nine years ago, back in the old chloroform days. The patient, a woman about thirty-five years old, was operated upon for some repair work on an old colotomy. She was a morphine habitue and chloroform was the anæsthetic used. About 12 hours after regaining consciousness, she became irrational, shrieking and crying out in violent delirium; her expression was one of intense fear; she became jaundiced and vomited coffee ground material; apathy followed by coma and then death within a few days. There was no autopsy, but looking back on the case it seems to me to be a typical case of late chloroform poisoning.

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A STUDY OF THE ACTION OF SCOPOLAMINE-MORPHINE ON THE HEART, LIVER AND KIDNEYS. REPORT OF SIX HUNDRED AND FIFTY CASES OF SCOPOLAMINE-MORPHINE ADMINISTERED AS A PRELIMINARY TO GENERAL ANESTHESIA.*

By C. M. Nicholson, M. D., St. Louis.

A study of the results of the experiments shows:

1. The effects of the injection of scopolamine and morphine into animals is similar to that of morphine when given alone, with the exception of the injection into kittens, in which excitement instead of sleep was produced.

2. Continued, repeated daily injections produce no degeneration of the heart, liver or kidneys, the physical condition is not impaired so long as injections are given at such intervals as not to interfere with the animal's nutrition. Daily injections of from one to three times the dose given to patients produces no pathologic changes in animals.

3. The toxic dose of scopolamine and morphine in my experiments correspond very closely to that of morphine alone for the animals used.

4. The autopsy findings on animals which succumb to a toxic dose are the same as those from morphine, *i. e.*, congestion of the viscera.

5. My animals seem to acquire a tolerance for the drug on long continued daily administrations.

The cause of death in patients who have died after operation and who were previously given scopolamine, has been more readily explained as due to great loss of blood during or before operation, to sepsis or to shock. They have been desperate cases and in not a single case could scopolamine be said to have produced death.

Scopolamine by itself is very slightly toxic for animals and certainly does not produce any degeneration of the heart, liver or kidneys.

I have injected scopolamine 1-100, morphine gr. ¼, three-quarters of an hour before administration of ether as a preliminary to general anesthesia in six hundred and fifty cases, and in this series the extremes of life had been avoided. In six per cent. of cases there has followed practically no results, but in the remaining ninety-four per cent. I have noted a quiet state of the nervous system previous to operation, that there has rarely been an instance in which the patient became excited or struggled during the administration of the anesthetic, the absence of mucus in the patient's throat, a lessening of fifty per cent. of the amount of ether used, the existence of quiet for some hours following operation, and the absence of post-operative vomiting.

DISCUSSION.

Dr. Walter B. Dorsett, St. Louis: I do not know of any subject I have been more interested in than anesthesia. We ought to pay more attention to this subject, and that anesthetists ought not to be classed as assistants, but as consultants, as suggested by Dr. Leighton. So impressed am I with this fact that I do not ask a medical student to give an anesthetic, nor do I believe medical students, as medical students, should be entrusted with anesthesia. Unless the man has had a special training, he ought not to think of taking the responsibility, nor should the surgeon, and I endorse the sentiments of Dr. Leighton in that regard. I have not had patients die from the remote effects of anesthesia, so far as I know. Outside of a jaundice that sometimes occurs in women, I know nothing about it.

For fear that some of the audience may be imbued with the sentiments expressed by Dr. Nicholson, of the innocence of scopolamine and morphine, I want to relate two cases of death in children from the injection in the mother of the H. M. C. tablet. Now, this tablet is, I believe, essentially a scopolamine-morphine preparation. I believe it has been proven that the cactine is a neutral substance. Two years ago I was expected to officiate at the delivery of a woman, a primipara. I was called out of the city and while away she was taken in labor and sent for a general practitioner, but a good obstetrician. When I returned, I found that the child was born dead. I was asked to consult with him. In the consultation room, he said that when he saw her, the pains were not very pronounced and he gave her an H. M. C. tablet. He then left to make some calls and came back in about three hours, and gave her another tablet, then went home to dinner. He came back, gave her a half of an H. M. C. tablet, made a few calls, and came back at ten o'clock, when the baby was born, and he had to use the forceps. There was no trouble in the delivery, but the baby was dead and cynotic. He said he did not know what caused the death of the baby. Two other cases which I will not relate in detail, were along the same line. Having been impressed by an article in the *Journal of the American Medical Association,* in which it was stated that babies had been born dead after the use of the H. M. C. tablet in obstetric practice, I am convinced that many practitioners are using this tablet, and I believe some of you could relate similar experiences. I am pretty positive it is injurious to the unborn child when used hypodermically on the mother during parturition.

Dr. C. H. Wallace, St. Joseph: Referring to Dr. Nicholson's paper, I would say that I have had some experience along the same line. After graduation, in my early practice, I was an interne in a State Hospital for the Insane. At that time hyoscin was used in quieting many patients. I used it very extensively, and I learned to have the most profound respect for this remedy. I have gone in and given the most maniacal patient a 1-50th to 1-100th grain of hyoscin, and in five, ten or fifteen minutes the man's muscular system would be paralyzed, and he would be unable

to move, sit up, or talk, and his respiratory system would be so paralyzed that breathing was scarcely perceptible. Upon two occasions where this drug was given and the patient left alone in the room—upon return of attendant the patient was found dead. I think it is a most dangerous drug.

The tablet mentioned by Dr. Dorsett is responsible for many deaths. I believe that in the case of a woman in labor, if you prolong the use of these tablets you could prolong the labor indefinitely. I know from personal experience that hyoscin is one of the most dangerous drugs that we have. If it is uncertain in its effect when used upon conscious patients where it can be watched, how much more hazardous must it be when used in combination with an anesthetic.

Dr. M. G. Sellig, St. Louis: Dr. Lutz has by inference attacked the position taken by Dr. Dorsett that only a specialist should administer an anesthetic. I take it that what Dr. Dorsett desired to bring out was that students should not assume the responsibility alone of giving their first administrations, but that their first administrations of an anesthetic should be given under the guidance of a skilled anesthetist. That brings up the point of the tendency in hospitals of giving over the administration of anesthetics to the nurses. Physicians are urging it on the ground that they have no large scope in life, and that they would rest content to give anesthesia all the rest of their lives. To-day we have chloroform, ether, somniform, spinal anesthesia, etc., all of which are good in their places, and are to be used to meet certain definite indications as manifested by the condition of the patient. A nurse can never be in position to know and understand these things until she has graduated from a nurse into the sphere of a physician. In the giving of anesthesia, the important question is: "Has the doctor fulfilled his duty to his patient?"

Regarding scopolamine, it was my privilege to publish the first paper that was published in this country on that subject. I was chagrined by reports just like Dr. Dorsett has given, and on the basis of these reports I quit using it. The effects do not seem to be constant, and I was unable to get any definite opinion from Parke-Davis & Co. as to the cause of this. I never knew why this was until I saw a report by Cushney to the effect that there is one type of scopolamine which in the polariscope rotate the beam of light to the right, and another type which rotates to the left. One of these types has a depressing effect on the cardiac and respiratory mechanisms. It seems to me that it is unfair to your patient to use a drug that is so frail and unstable in its effects that it depends upon the direction of rotation. I have been absolutely unable to get any guarantee from the drug houses, and I have ceased to use it.

Dr. Block, Kansas City: The first two papers read on this subject certainly meet with my approval in a general way. It is true, as Dr. Lutz has pointed out, that somebody must learn to do this work, and all of us must have a beginning in the vocation we undertake. That is no excuse, however, for the inefficient, unprepared person undertaking to do this work right along. Emergencies permit us to take responsibilities

that we should not assume regularly. I feel more certain of my results when the anesthetic is in the hands of a person qualified to administer it.

In reference to the paper by Dr. Nicholson, it has one commendable quality we must all admit, and that is, a painstaking effort trying to learn the lethal effect of these drugs. It occurred to me that this is a very old story. We are familiar with the effect of opiates on animals, that they can be given in enormous doses without lethal effects, and it is difficult to draw conclusions from these results as to their effects on man. If he could perform a series of experiments upon a group of men who would submit to them, a sort of a poison squad, I think he would find that they are dangerous.

It is his general practice to administer hyoscine-morphine prior to administering a general anesthetic. I prefer to give a small dose of morphine, because I get better results.

I wish to put on record another case of disaster where H. M. C. tablets were administered. A certain homeopath administered three doses for a very small operation—removal of adenoids. This was the only anesthetic. The patient laid in a stupor for a week, and has not yet entirely recovered, although nearly six months have elapsed since the drug was administered.

Dr. Punton, Kansas City: I want to emphasize the point of the relationship of the anesthetist to the patient. Not being a surgeon or professional anesthetist, but having had many cases that I have referred to the surgeon, and watching the effects of the anesthetic at the time and after the operation, I am thoroughly convinced that he is correct when the essayist advises that we make known to the patient who is to administer the anesthetic, as well as who is to perform the operation. From a lay standpoint I think this appeals to the public generally. I can conceive how difficult it is in the country districts, where the physician has to accept the services of inexperienced persons, being removed from the centers where such specialists are to be found, but there is no excuse for such methods in the cities. Ten years ago there were no professional anesthetists, but it is different to-day. Dr. Bennet is now the leading anesthetist in New York City. I have just returned from New York, and there are men there who devote their entire time and attention to that one subject. The surgeons of the most recognized ability are now most particular in the selection of their anesthetists. Some years ago there was an article in the *Medical Record* calling attention to the fact that there was not then in the entire State and City of New York a single man devoting his entire time to this work. I called Dr. Bennett's attention to it, and told him that there was his opportunity, and he went there, and is now recognized as the leading anesthetist in New York City. I claim that Kansas City has some credit in introducing anesthesia as a specialty. I wish to state that this is a greatly neglected specialty. There is a disposition among a certain class of surgeons to

ignore, to a very large extent, the importance of it. That tendency, however, should be condemned.

Dr. Gordon A. Beedle, Kansas City: I wish to say that there is the highest appreciation on the part of the surgeon with reference to the anesthetist at the present day. We have advanced beyond the stage where we deluged a patient with the drug, to where more consideration is given. With reference to the advance in anesthesia, I think the essential point to be considered before anesthesia will ever give absolute satisfaction, is the efforts that are being made to judge the exact amount of the drug to be given. Efforts along this line are being made by several anesthetists in the United States to-day, and some of them are getting fine results. There is no reason why we should not be just as accurate in knowledge of the amount of the drug we are administering to the patient as we are in the use of any other drug. I believe on that point depends the greatest success in the use of anesthesia.

Dr. Herman E. Pearse, Kansas City: In speaking to the paper by Dr. Stevens, I hope that next year he will write another paper on "The Late Effects of Chloroform Anesthesia." My attention was recently called to a case of chloroform poisoning, where it had been administered for anesthesia. I have had cases called to my attention of attempted suicide by drinking it. The symptoms preceding death were those called to our attention by Dr. Stevens, and were similar to the mild types of sepsis that we find after abdominal operations. I believe further investigation along this line will establish the fact that many of the deaths due to sepsis have in fact been due to the effect of chloroform on the liver.

Dr. Stevens, in closing: In this closing discussion I would like to say a few words on Dr. Leighton's paper. It filled me with joy to hear an anesthetist who had nerve enough to get up in this body and tell the truth in regard to anesthesia. It is only through the surgeon that anesthesia is going to be elevated to the position it should occupy. There is need of a diagnosis by the anesthetist as well as by the surgeon. Not only should you select the anesthetic that you deem best, but you should give it according to the best method, also you should consider the question of whether the patient should receive a preliminary injection, and if so, what drug, and in what doses. All through the anesthesia the anesthetist has to make a thousand and one diagnoses that come up, and judge from seemingly trivial symptoms what is going to follow.

In regard to Dr. Nicholson's paper, there is one point that I think has been overlooked. I think the use of scopolamine-morphine is very dangerous when used by one not accustomed to the use of anesthetics; for these patients are very much more sensitive to ether than those who have not had scopolamine-morphine. I know personally of three ether cases where fifteen to thirty minutes after the operation the respiration ceased and artificial respiration had to be kept up for from one-half to one hour. Dr. Lutz asks what we consider best for the general practitioner.

I would say for them to forget that there is such a thing as chloroform and use drop ether, which will do less harm and cause less trouble than chloroform.

In regard to my own paper I have nothing further to add, except to say I wanted to present as briefly as possible the scientific facts that have been worked out by men who have made a very thorough study of this subject.

Dr. Nicholson, in closing: The discussions have been limited to other than the proposition set forth by me. I have used scopolamine in conjunction with morphine, not to produce anesthesia, but as a preliminary to ether anesthesia. I fully agree with Dr. Wallace that it is a dangerous drug. The same may be said of strychnine and morphine and most of the other valuable alkaloids. Dr. Campbell seems to have considerable experience with scopolamine. However he has made use of three times the amount advocated by me. Whitaker, so far as I know, is one of the few men who have thus far made an original investigation of the action of scopolamine. In more than six hundred cases where scopolamine-morphine was used, my anesthesist, who is a most capable man, used less than one-half as much ether as when scopolamine-morphine was not given. It quiets the patient prior to operation, diminishes the amount of anesthetic by one-half and overcomes post-operative vomiting.

OCULAR DISEASES DUE TO SYSTEMIC INFLUENCES.*

By W. H. Minton, M. D., of St. Joseph, Mo.

To consider diseases of the eye as a unit, separate and apart from systemic influences, would, many times, be a source of error in the diagnosis and treatment of ocular affections.

That there exists a close and intimate relation between the body and the eye, as its appendage, cannot be too strongly emphasized. The connection is formed by a double link, or union, one part of which is composed of central, sympathetic, and special nerve tissue; the other, a vascular union, through which the eye receives its nutrition. These two systems place the eye in an exceedingly close proximity to the whole organism, of which it is a part, making it impossible for the one to perform normal functions, independently of the other. Therefore disease of either of these connecting media, frequently produces changes and abnormal functions in the eye, when the original lesion may be quite remote from its ocular manifestation.

These facts are generally recognized to-day by the medical profession, and as a result, we see the coöperation of the oculist and the internist, and more efficient work being done in their respective fields.

By way of illustration, there can be cited no better example other than lesions located in the kidney. Every physician called upon to diagnose and treat the various kidney affections, in which albuminuric urine is found, is frequently led to make a urinalysis through ocular disturbances, since from 10 to 15 per cent. of the various kidney affections are associated with ocular changes. A patient complaining of gradual loss of vision, headaches, puffiness of the lower lids, etc., at once suggests to our minds an ophthalmic picture, a description of which would be the characteristic star-shaped figures, ill-defined nerve, head and retinal hemorrhages, thus constituting a group of symptoms very indicative of renal disease. The diagnosis may be easily confirmed by subjecting the urine to the nitric acid, or boiling test. Hemorrhage in the retina, is an important symptom, as it denotes a general circulatory disease, which usually has a fatal termination, within six months or a year.

Albuminuria of pregnancy is one exception that may be mentioned, as regards life and vision. If the albumin does not make its appearance until about the last two months of pregnancy, the prognosis is more favorable, as the vision is generally recovered after the kidneys have resumed their normal functions.

*Read in the Eye, Ear, Nose and Throat Section, Fifty-second Annual Meeting, Missouri State Medical Association, Jefferson City, May, 1909.

Another disease which is characterized by affecting connective and nervous tissue, and blood vessels, thereby revealing itself in the eye, is syphilis. Almost every structure of the eye is subject to its ravages, but the choroid or vascular tunic, and the retina, are probably the most often attacked, as syphilis shows a predilection for the circulatory and nervous systems. In the vessel there is produced an inflammatory condition, with a resulting proliferation of endothelium, and a subsequent sclerosis. As morbid changes are taking place in the choroid, there is pigment migration occurring in the retina, principally along the course of the vessels, and finally both choroid and retina have undergone pathological changes, eventually resulting in atrophy and degeneration. The ophthalmic picture of a syphilitic fundus will depend largely upon the structures affected and the stage to which the inflammation may have developed. In the early stages, the retina and optic nerve are infiltrated by inflammatory products, the blood vessels tortuous and partially concealed by exudations. Isolated white patches appear, free from blood vessels, with ill-defined outlines, and not infrequently, dust-like opacities are seen in the vitreous. The iris is occasionally attacked by syphilis and the exudation is very profuse; although the accompanying pain is not nearly so severe as in rheumatic type.

Among the early and improtant systems of tabes, may be mentioned the ocular phemomena, which are of great diagnostic value. Generally speaking, the symptoms of the tabes form a tripod, composed of incoördination, loss of tendon reflex, and the Argyll-Robertson pupil, the latter condition often antedating all the other symptoms. Simple and progressive nerve atrophy are occasionally met with in tabes, and not infrequently lead to complete blindness. Simple atrophy in the absence of all other nerve symptoms, is very suggestive of this disease. Along with the Argyll-Robertson pupil and optic nerve atrophy, it is extremely common to find ocular palsies, involving the third, fourth, and sixth nerves; however the paralysis is, as a rule, not permanent, lasting only a few days or weeks. Ptosis, or dropping of the upper lid, is one of the most common forms and generally due to nuclear lesions.

The nutritional disease, known as diabetes, in which the pathology is probably located in the pancreas, is often complicated by pronounced alterations in the eye structures. The glucose and other toxic substances in the blood affects the entire vascular supply to the eye, and as a result we have extensive retinal hemorrhages, retro-bulbar neuritis, optic nerve atrophy and what is commonly known as diabetic cataract. Fundus changes, resulting from diabetes, are occasionally difficult of differentation from those met with in nephritis, and urinalysis is necessary to confirm a diagnosis.

Migraine, or sick headache, from its three groups of symptoms, as in tabes, may be likened to a tripod, having ocular disturbances as one prominent feature. The visual aura of migraine is usually characteristic, such as scintillating lines, zigzag, or whirling figures, or sectors of the

visual field entirely obscured, producing temporary blindness in that particular field. The pathology of migraine is not well understood, and all the symptoms are mainly subjective, with very faint fundus changes during the height of the attack. Errors of refraction play an exceedingly minor part in the production of this disease; however, many cases are benefited and the attacks lessened in severity by correcting refractive errors.

In cerebral and spinal meningitis, the eye symptoms are not constant and depend largely upon the seat and form of inflammation. The cerebrospinal form, is often complicated with plastic choroiditis, and the tuberculous form is occasionally followed by post-neuritic atrophy. Any variety of meningitis may be complicated by ocular palsies.

Brain tumors are of special interest only from a surgical view, and reveal themselves in a variety of ways. Tumors developing within the cranial cavity, producing symptoms of intracranial pressure, often manifest themselves in the eye, and the eye symptoms frequently give some clew as to the locality of the cerebral growth. Optic neuritis and muscular palsies are the principal signs of intracranial pressure. Resulting from the pressure and irritation, produced by the neoplasm, we have different groups of muscles affected, and by continuity of tissue a resulting optic neuritis. The so-called "choked disk" may complicate hemorrhagic anemia, diabetes or albuminuria, but its presence is most indicative of brain tumor, and is a great diagnostic factor.

There remains one other constitutional disease, well marked by ophthalmic symptoms, which is known as Graves' disease, or exophthalmic goiter, the pathology of which is generally conceded to be due to an excessive functional activity of the thyroid gland. The eye symptoms, within themselves, are sufficient to warrant a diagnosis. The protruding eye, enlarged palpebral fissure, Graefe's sign or a lagging behind of the upper lid in downward movement of vision, and a venous bruit which may be heard by placing a stethescope over the closed lid, constitute the principal ophthalmic symptoms of Graves' disease.

The chronic inflammatory and degenerative disease of the vascular system, known as arteriosclerosis, not infrequently calls our attention to the eye.

The changes occurring in the retina are mainly an overgrowth of connective tissue and degeneration of the vessel wall, affecting all three coats, especially the intima, giving the vessel a thickened and rigid appearance.

Too many times the disease is brought to our notice by extensive retinal hemorrhages, producing partial or complete blindness, depending upon the extensiveness and location of the hemorrhage.

It is hardly necessary to say that there may exist a similar condition in the cerebral vessels, therefore we readily see the great importance of recognizing arteriosclerosis at an early date, in order to exercise the

greatest of care in preventing the development of the graver phases of this disease.

In reviewing the diseases of the eye, due to systemic influences, we have been compelled to omit the less important, and those touched upon have been necessarily briefly considered, but a review of them in connection with their ocular manifestations, establishes two facts; first, that properly to diagnose and treat disease of the eye, systemic influences must be reckoned with; and, secondly, that ocular disturbances may, many times, be the source of discovering an unsuspected systemic disease.

DISCUSSION.

Dr. John Green, Jr., regarded the paper as timely and indicative of the most recent tendencies in ophthalmology. In the earlier days of ophthalmology it was customary to look upon the eye as an isolated organ, uninfluenced by the general organism. Of recent years it has been the fashion to exaggerate the importance of the eye as a factor in the production of morbid conditions in various parts of the body. It is only within the last decade that ophthalmologists have begun to realize that a survey of the entire medical horizon is indispensable to a comprehensive knowledge of diseases of the eye.

Dr. F. C. Ewing, St. Louis, said specialists should bear in mind systemic conditions, such as diabetes, tabes, etc. He believed specialists should first have been general practitioners.

Dr. A. E. Derwent, Clinton, believed that no man should be a specialist until he had been in general practice for at least five years. He need then never fear that the surgeon would take his operative cases away from him, for he should be better prepared to care for them than the general surgeon.

Dr. J. D. Pifer, Joplin, said ptosis was usually due to local conditions, unless complicated with other pareses when it is nuclear.

Dr. Minton, in closing, stated that he had spoken of ptosis only in connection with brain tumors, in which case it was, of course, a nuclear affection; locally, it is usually due to trachoma or trauma.

MEDICAL JURISPRUDENCE.*

By W. R. Littell, LL.B., Tarkio, Mo.

Medical jurisprudence is that branch of the law which necessitates medical evidence, as a means of justice, in the trial of a case at law.

This branch of the practice of law has been added to as the science of medicine has progressed, until at present it forms a very respectable division of the law.

In the early days of the human family, when men held what they could by superior force, the question of law or of medical jurisprudence did not enter into the calculations of the legislators of the time.

As order came out of the chaos and the strong were compelled to recognize the rights of the weak, both the legal and medical systems grew in numbers, in wealth of discovered fact, and in usefulness. The legal system grew the more rapidly because it had to do with the acts of men in relation with each other, and was chrystalized out of the ever increasing struggle between the weak and the strong, financially, in the governments of the earth. Law is a rule of action, and none could fail to understand it so if once established by proper authority. The Christ so taught, and Moses, the divine founder and promulgator of the moral law so teaches. All equity writers, since the time of Moses, have followed his precepts, and have added to them as new conditions arose among men calling for a new rule of action. The Mosaic law stands to-day as the foundation of the equity jurisprudence of every civilized nation of the earth. New conditions have added to it, but all the old landmarks stand.

The science of medicine grew more slowly, from its very nature. Any of the ancients could understand the nature of an assault and see the necessity of a law to prevent or punish it. None of them could diagnose a case of appendicitis, for the simple reason that it was beyond the experience of men at the time. Witchery, sorcery, the black art, and other fetishes of the early days were the awakenings of the medical minds among men, looking toward an improved state in the treatment of disease.

Æsculapius, the founder of the noble art of medicine and surgery, deserves a place among the greatest men the earth has produced. The systems of law and medicine grew side by side and waxed strong as the peoples of the earth grew. From meager beginnings they waxed stronger and began to overlap each other, and curiously too, the systems first began to overlap each other on the questions of property rights. The very first cases and one of the most famous cases arose in the infancy

*Read before the Atchison County Medical Society, July 1, 1909.

of medical jurisprudence, and was touching the legitimacy of a child, born almost 11 months after the death of the father.

I believe the books show that medical jurisprudence had its origin in the early contests over the property rights of persons, involved in disputes as to the legitimacy or illegitimacy of children who might be heirs, or who, if living, might make their parent or parents heirs to vast estates. This same question is the frequent source of dispute in the courts of to-day and the medical brethren are called in to add their testimony on a given set of facts. This phase of the matter is now more settled by reason of the many adjudications upon the subject, and the extreme times of child bearing can now be said to be judicially fixed.

The science has followed the trend of most sciences and professions of to-day and has become specialized to a great degree. The great mass of human experiences along almost any given line, or in regard to any specific condition or crime, have been collated, so that any reputable physician, on being given the statement of fact, can at once give a convincing answer or state a legitimate conclusion from the facts before him. The universal spread of education among the people has done much toward settling many disputed questions and aided to chrystalize them into statute laws or adjudicate them into decisions of our courts.

My cursory examination of this matter from the medical standpoint, leads me to commend the subdivisions of the subject compiled by Mr. Tidy. I would suggest, however, that from the legal standpoint, the work should be divided into two chief classes, one having to do with the civil side of the law courts, and the other with the criminal side. Such a division would give us legitimacy and paternity of children pregnancy, live birth on the one side, and abortion, rape, infanticide, and other forms of homicide on the other.

There is a comparatively new class of cases coming into prominence at present, both on the civil side and on the criminal sides of the courts, that are attracting considerable comment. The first are those classes of cases affecting the competency of persons to transact business or to dispose of property by wills or otherwise. The second is the question of accountability for criminal acts done under certain conditions. The latter class of cases is fully set out in example by the recent celebrated Thaw case, where it was sought to excuse murder on the ground of the unaccountability of the murderer by reason of a brain storm. We are indebted to the physicians testifying in that case for coining the new term, brain storm, and adding it to the wealth of the medical vocabulary. I do not have much sympathy for the hard situation a defendant like Thaw finds himself in. The unwritten law could hardly be made to stretch far enough to cover his case, and the defense of brain storm seemed to be an invention of the medical genius to bridge over a desperate situation. I assume that it was done on the theory that the end justified the means. In any event, if Thaw's statement is to be credited, White was properly killed, and we have no quarrel with the medical

gentlemen in inventing a new way to prevent his punishment for the alleged offense.

The real question that comes up in connection with this class of cases, is the attitude of the medical fraternity toward society and the enforcement of the law along those lines. The physician stands before the law upon his honor and the law does not attempt to say what even his discretion shall be, but allows him full latitude to exercise his professional skill. The physician should return this confidence by giving to the courts his best service in the effort to detect and punish crime. If he does so the courts and people respect the sincerity, dignity and ability of the medical profession. If he fails to do so, he cheapens the whole profession before the people who are the final judge in our country.

In this respect it is worthy to note the gradual elimination of what, a few years ago, was termed expert testimony. The causes were always finally submitted to a jury for final determination, and only a short time ago it was greatly in vogue to call expert testimony, in the way of specialists, along any line but especially along medical lines. The physician was assumed to have a superior knowledge of what he testified to, and doubtless did, but a few miscarriages of justice, induced by reliance on such testimony which was not clearly disinterested, lead to the overthrow of the entire system of expert testimony, and now the practice is that any person can testify as to matters of his knowledge touching the condition of a person or other matter where expert testimony had formerly been exclusively used.

In this connection, a little story perpetrated by Lord Morris, the famous Irish judge, may not be out of place. Lord Morris was holding court at Coleraine, during the hearing of an action for horse poisoning, when he was very much amused by the self-sufficient air with which a doctor was giving evidence to the effect that twelve grains of the poison in question could be administered to the horse without fatal consequences. The judge eventually said to the witness: "Tell me this, wouldn't twelve grains kill the devil himself if he swallowed it?" The doctor, much shocked, drew himself up in the box in pompous fashion, and replied: "My Lord, I have never had the honor of prescribing for that patient." To this Lord Morris, using the broadest of Irish brogues, replied, in a most confidential tone: "Ah, no, dochter, dear, ye niver had. More's the pity, for the old boy is still alive."

The high ground of professional integrity and self-respect is the only safe ground for the medical fraternity in dealing with the courts. This they have always occupied and we believe will continue to occupy.

The other new phase of medical jurisprudence is much broader and far reaching in its effects on the lives of other individuals, because more persons are involved, and the question arises most frequently in the disposition of property.

The law deals with the manner in which a man may dispose of his estate. He may dispose of it by will or deeds, or otherwise, and the

evidences of his disposition be fair on their face, yet at the same time the disposition may not be that of the maker at all, but that of some controlling mind, dictating the disposition before death. This class of cases, from their very nature call for the highest and most conscientious service on the part of the physician, because his testimony carries much weight as to the competency of the testator, and the physician's testimony should be unbiased by employment or other considerations.

Every lawyer has these cases every year and it is a hard condition to meet. Much injustice grows out of it by reason of the fact that the only person who could shed light on the subject is dead and his lips are closed. Those who profit by his overreaching also keep silent on the subject and the victims of the injustice are usually compelled to suffer the injustice done them, when the testimony of a fearless physician, with knowledge of the incompetency of the deceased, would right the wrong.

I now have a case in mind. The facts follow. A is 75 years old. His first wife is dead. His children by her are married and gone from home. He marries a second time and has children by his second wife. His second wife is young and vigorous. He becomes feeble in health, is unable to work and takes to his bed. He becomes rapidly worse and the family physician is called in. Later he has a sinking spell and sinks into almost comatose condition. The family physician arrives in time to rally him by giving stimulants.

A is much emaciated and very weak. A lawyer is called to prepare a will. Lawyer comes. A is asleep, is awakened to see lawyer. Ostensibly discusses terms of will with lawyer. Lawyer retires to write will. A goes to sleep and is awakened to sign the will. Is unable to give names of two small daughters. Will leaves all the property to living wife and children by her. The question arises, is the paper the last will of A. Here is a family of children disinherited by A, who helped A to make the property he possessed at his death. This is as fair a case for determination by medical testimony as we usually meet. The will is manifestly unjust, but if A was competent to make the will at the time he made it, the will is good. The whole matter turns on the question of his competency. I should like to hear this particular instance fully discussed.

Medicine and law have always stood hand in hand in their efforts to uplift mankind. The legal fraternity have doctored humanity, politically and morally, while the medical brethren have looked after its physical welfare. There is a dignity pertaining to law which rests upon a certain kind of conservatism. The conservatism of medicine growing from a different class of considerations, rests as much upon tradition as does that of the law.

The practice of a lawyer is in the open court and his acts are open to public criticism, as well as public attention. He is judged, and must stand or fall, by virtue of the ability displayed in his handling of cases. The physician practices in the sick room, remote from the public gaze,

and his success is gauged largely by the results he accomplishes. Each profession has a code, and its accompanying forms, governing the practitioner, and each profession should respect the code of the other.

Lawyers, as a rule, adhere closely to the code governing the relations of lawyers to each other in the practice of law. Doctors adhere as closely to their code of ethics in the practice of medicine. Neither profession has been as careful in its attitude toward the other as it should be, in cases where they meet on a common ground.

We believe that the two professions should stand in an attitude of helpfulness toward each other, and to that end there should be a code of ethics governing the relations of lawyers and doctors.

Lawyers, as a rule, practice medicine entirely by ear. That is, they get hold of a case involving medical testimony, and they forthwith visit some unsuspecting doctor and ask him all the questions that they can think of about the medical features of the case, and form their conclusions from what they can learn from that source. They then spring it on the jury, and try to look wise while doing so, the same as though they had known the facts all along and were only permitting the doctor to testify to it as a mere matter of courtesy. In this connection an apt story is told of the late Grover Cleveland, who had been persistently annoyed by a brother lawyer, who absolutely refused to look up a case or do any labor in the way of looking up the law. He would get a case and then visit Mr. Cleveland's office and inquire of Mr. Cleveland what the law was governing it, and would put him through a severe cross-questioning upon the matter.

Mr. Cleveland became tired of this procedure and one day when his co-laborer appeared to know what the law was governing a certain case, Mr. Cleveland directed him to the library and told him that there were the books and that he could look the case up for himself. The lawyer was intensly surprised and indignant, he sprang up in amazement, and indignantly replied "Look here, Grover Cleveland, I want you to distinctly understand that I practice law entirely by ear."

So the lawyers practice medicine by ear, and they frequently illustrate the old saying, that any fool can ask questions which a wise man cannot answer, in the bungling way that they attempt to elicit evidence from the medical fraternity on the witness stand.

The importance of the relation of the man of medicine to his patients, as well as that of the lawyer to his client, is emphasized by the statute law of the land, in making communications between them privileged from being pried into by the inquisitive lawyer on the hunt for evidence. This is properly so, for next to the moral law for the cure of sick souls, as administered by the clergy of the land, and the family relation, the relation of the doctor and the lawyer to his patient and client is the most sacred of human intercourse.

It is not my purpose to discuss concrete cases, where the code of medical jurisprudence is applicable, in the enforcement of law or discovery of crime. Suffice it to say, that it has an ever widening field and

increases yearly in importance. Such a discussion, by a lawyer, would also lay one open to the charge of pedantry. It is much easier to ask the doctor, and the information received from that source is of much more value.

I have in mind a case or two offering unusual features that might not be amiss. Some two years ago a case came under my observation, in a breach of promise suit, where the woman was suing for a breach of promise of marriage. The man was manifestly innocent, and the case was one where the woman was attempting to take advantage of the fact that the man had shown her some attention. Very little good evidence is needed upon which to found damages, when a woman is asking it in a breach of promise case. The man had been in the company of the woman and had given her his picture. He had not been in her comapny but a time or two. Research developed the fact that the woman had had the operation of hysterectomy performed upon her and had one ovary and the fleshy portion of her womb removed. Medical evidence deduced the fact that she could not bear children, that she was barren, and that is a complete defense to the action. She lost her case.

Several cases of this character have come under my observation in the criminal line. A young girl, say about 15 years of age, becomes pregnant from some source. The fact of pregnancy is the only evidence of sexual intercourse, but it is too all-convincing of the existence of a crime to permit of argument. The question of the guilty party is the one to be determined. The girl usually lays it to some one of whom she thinks a good deal and invariably swears that only one act of sexual intercourse took place, and that she never had intercourse with any other male person.

The question is this, can a girl of that age become pregnant from a single act of sexual intercourse and that act be the first and only one in all her experience. I have tried, and helped to try, several cases involving this identical point. The medical evidence offered has not been of the convincing character that which it seems to the legal practitioner that it should be. If such a case goes to a jury with the testimony of the girl on one side saying that the boy did it, and the boy on the other side saying that he did not, and the doctor saying that it is very doubtful if the girl could become pregnant under the conditions, that she might or might not, hum, haw, and so on, the poor boy will be convicted by the tender hearted jury, who seem to think that the boy ought to have wanted to do it and should have done it whether he did or not.

You, gentlemen of the medical profession, would confer a boon on many a poor boy if you could fix some reasonable definite line of demarcation along this line. There is need for it.

Criminals, as a rule, are sharp only in their crimes. They do not know the laws of medicine as applied to the human body after death, and hence in this line the evidence and skill of the physician is of inestimable value in the detection and punishment of crimes where the evidences of the crime are sought to be concealed by disposition of the body after death

so as to stimulate accident. Poisoning, strangulation, asphyxiation, and others, are the common forms of this phase of criminology, that usually confront the physician.

Our courts have always stood for the best interests of the respectable physician and have offered him all the protection possible in his business and in his efforts to relieve human suffering.

A recent decision of our courts might be of interest to you gentlemen, since I have understood that your society has recently adopted a standard fee system to govern your charges.

In the case of Rolf vs. Kassemeier, reported from Iowa, in this year, the court held such schedule of fees so adopted to be legal and not a violation of the anti-trust laws, nor a combination of laborers to fix prices.

The court in passing on the matter has this to say "The most important question in respect to the combination of physicians to fix fee bills does not relate to the legality of such an organization, under the anti-trust laws, but to ethics, honor and self respect. The right of a physician to make a very small charge or none at all to those who have scant ability to pay is one which humane physicians without number have always exercised. This right would appear to be seriously restricted by the adoption of a fixed fee bill, unless it provides for exceptions in cases of that nature. It is certain that physicians who regard themselves as members of an honorable and beneficient profession, will not subscribe to a fee bill, if at all, without reserving the privilege of making exceptions in favor of the poor." (118 N. W. 276.)

This is a splendid tribute of respect and confidence paid by one profession to another, both striving to a common end.

But I must close, or I fear my hearers will need the services of some of the medical brethren. I shall not attempt a tribute to the life and services of the honest medical practitioner. His life is one long round of service in relieving pain and disease, and "service is the measure of greatness." There is no night too dark, or stormy, no road too long, or effort too great for the physician to reach his patient. Exposure, discomfort and hardships do not count with him when duty calls. Often, without the hope of reward, he goes and gives his time and his knoweldge for the alleviation of suffering, his only compensation being the consciousness of duty done. The doctor's calling is one of the mightiest of the earth. There is everything in it that calls a man to his highest sense of duty and his best efforts. The three greatest callings are the clergy, medicine and the law. Men cannot live to life everlasting without them and when men come to die they call the lawyer, the doctor and the minister.

So gentlemen, in passing I am glad to say that we should strive with each other, not in bitterness and malice, tearing one another, but in friendship, and unity toward the common end of benefiting humanity and adding to the world's store-house of discovered truth things that will aid those who come after us. Only in so doing do we live up to the full stature of a man.

THE PHYSIOLOGY OF SHOCK.*

By M. G. Seelig, M. D., and E. P. Lyon, M. D., St. Louis, Mo.

It seemed only a short while ago that the question regarding the underlying physiological basis of shock was settled for good and all. The excellent experimental work done by Crile established a doctrine, so generally accepted that one hardly felt the necessity for any further investigative work along similar lines. And yet, withall, the problem of surgical shock is not solved, and we are about as much in the dark as we were two decades ago. It is not entirely without interest to survey, from an historical point of view, the work that has been done along these lines. The clinical picture of shock, such as we recognize it to-day, was not unknown to the ancients; indeed, they vividly expressed their loss to account for death following severe trauma, without visible post-mortem lesions of gravity, by referring the *exitus lethalis* to a "Deus ignotus." And right here it may be said that the unknown god, by virtue of inherent necessity, still plays no small part in our conception of the etiology of shock. This vague and, if we may so term it, theistic conception was not displaced until toward the beginning of the 19th century. Indeed, the word "shock" as we now use it, was first introduced in 1795, by James Latta. Up to this time "shock" signified merely a force, or blow, but Latta changed the significance of the word, so that it connated the results consequent upon a force or blow. So apt is the word, and so specific in nature, that it has defied translation, and been taken over bodily in all the continental tongues.

Guthrie, Hennen and Travers did much to stimulate interest in the causation of shock, and their work was all the more effective by virtue of the fact that just about this time (1827) railroads were coming into popular use, and were increasing the list of cases of shock due to severe trauma. Astley Cooper, Copland, Paget, Erichsen, Pirogoff, Little, Syme, Savory, all added contributions to the subject. So far, however, no one had attempted to attack the problem by way of experiment. The Crimean war, and also our own civil war, with their tremendously long lists of injuries and fatalities, emphasized the absolute necessity of determining to what factors this obscure symptom complex owed its origin. The medical report of the Crimean war epitomized, in one sentence, the uncertain state of knowledge concerning shock, when it stated that "the term shock is a convenient name, but not a very philosophical

*Read in the Surgical Section at the Annual Meeting of the Missouri State Medical Association, Jefferson City, May, 1909.

Note.—From the Physiological Laboratory of the Medical Department of St. Louis University.

one." As a result of observations made during our civil war, W. W. Keen, Weir-Mitchell and George Morehouse,[1] working together, framed a theory that explained the phenomena of shock in accordance with the same principles laid down by Crile nearly forty years later. Keen's work was largely clinical, Crile's largely experimental. Keen's clinical deductions, however, were confirmed by experimental work done in Germany during the seventies by Jordan and Fischer, both of whom founded their work largely on the now famous experiments of Goltz.

As the problem stands to-day there are several contradictory theories. Crile[9] and his followers maintain that vasomotor exhaustion is the primary cause of shock, Boise[10] states that cardiac exhaustion is the prime cause, whereas Howell[11] believes that both these factors (cardiac and vascular) must be reckoned with. Meltzer,[12] after a critical survey of the literature, concludes that shock is consequent on the development of the inhibitory side of all the functions of the body. Kinnaman[2] argues for a disturbance of the thermogenic function, Jaboulay[3] for the formation of an irreducible oxyhemoglobin, Vale[4] for an increased specific gravity of the blood, Henderson[5] for the reduction of the carbon dioxid content of the blood and tissues (acapnia), Bainbridge and Parkinson[6] for a loss of chromaffin tissue following trauma, and Schur and Weisel[7] for a loss of this same tissue following the administration of volatile anesthetics.

Our object is neither to criticise these various theories nor to add a new theory to the already formidably long list. Cardiac excitation and inhibition, vascular dilatation and contraction, the modus operandi of the sympathetic nervous system, the complex phenomena of exhaustion and inhibition, would all have to be taken into account by a theory, despite the fact that not one of the factors that we have mentioned is understood fully.

This much is certain, however: that low blood pressure is a constant accompaniment of a pronounced degree of shock—so constant, indeed, that investigators practically always express the state of shock in terms of manometric pressure. We have based our experiments on the fact that the blood pressure is always low in shock, and we have set as our problem the determination whether the peripheral vessels are contracted or dilated during the time that the pressure is low in the larger, more centrally situated vessels, such as the carotids.

Mitchell, Morehouse and Keen, Groeningen and others assert that the peripheral vessels are not contracted, because, in the first place, no one has ever shown that they are, and, in the second place, because it is not probable that the peripheral vessels can be contracted tightly for any great length of time.

1. Circular No. 6, Surgeon General's office, 1864.
2. Kinnaman, R. C.; Internat. Jour. Surg., 1904, p. 378.
3. Jaboulay, L.; Lyon méd., 1904, p. 378.
4. Vale, F. P. Med. Rec., Aug. 27, 1904.
5. Henderson, Y.; Am. Jour. Physiol., 1908, p. 126.
7. Wien. klin. Wchnschr., Feb. 20, 1908.

Crile argues that, consequent on vasomotor exhaustion, the peripheral vascular system is paralytic and, therefore, relaxed. Porter,[8] on the other hand, denies Crile's contentions *in toto,* and seems to show that the vasomotor center is not exhausted. Neither Crile nor Porter, however, directed their attention to the vessels themselves.

Malcolm,[13] of London, dealing with the problem from a purely clinical point of view, makes two assertions: 1, that the peripheral vascular system is contracted in shock; and, 2, that a state of low blood pressure is thoroughly consistent with contracted peripheral arterioles. Malcolm makes an uncommonly strong clinical argument against the views of Crile in a fashion that refreshingly demonstrates the invaluable aid of clinical medicine to laboratory experimentation. If the theory of vasomotor exhaustion is correct, says Malcolm, then the network of smaller peripheral arterioles, being cut off from central control, must be relaxed. This relaxation should result in an overfilling of the vessels, but, as a matter of fact, all clinical evidence speaks against such an overfilling: the body surface is cold and pale, the mucous membranes are anemic, incisions made during the state of shock are almost bloodless, the radial pulse is often small to the degree of being inpalpable, and the application of surface warmth tends to lessen the symptoms of shock, despite the fact that warmth usually relaxes vessels.

There are three possible ways of determining whether the peripheral vessels are dilated or contracted: 1, the vessels may be inspected visually; 2, the outflow of blood from an organ or extremity may be measured; 3, coincident variations in venous and arterial pressure may be measured. In our work, which has been done on dogs, we have used only the first two or three methods. We studied visually the vessels of the retina and measured the outflow from the femoral vein. We selected the eye as the site of visual inspection of the caliber of the vessels, because this is the only situation where the vessels can be studied without the necessity of exposing them by dissection. It is unnecessary to say that the caliber of a vessel that has been traumatized by dissection affords no reliable index of the caliber of that same vessel in an undisturbed state. We selected the femoral vein from which to measure the outflow because the circulation in the extremity is, in the strictest sense of the word, peripheral, and because the femoral vein is more accessible than is the axillary.

Our procedure was as follows: Under Grehant anesthesia the carotid artery was connected to a recording manometer and the blood tracing started. Both femoral veins were dissected free, ligated where they leave the thigh to enter the abdomen, clamped just below this, and divided between ligature and clamp. Paraffined canulas were tied into the distal

8. Porter, W. T.; Am. Jour. Physiol., 1907-08, pp. 399, 444, 500.
9. Crile, G. W.; Blood Pressure in Surgery. Phila., 1903; An Experimental Inquiry into Surgical Shock. Phila., 1899.
10. Am. Jour. Obstetrics, 1907; Trans. Am. Gyn. Assn., 1908.
11. Amer. Med., 1904, p. 482.
12. Arch. of Int. Med., July, 1908, Vol. 1, p. 571.
13. Malcolm, J. D.; Lancet, 1905, i, ii, 57 Med. Chir. Tr., 1908.

ends of the veins. Both sciatic nerves were dissected free at the posterior aspect of both thighs, and a bridle ligature was placed under each nerve so that it could be drawn out and divided with ease and rapidity. Only a minimal amount of fall of blood pressure resulted from this preliminary, as a rule.

The clamp was now removed from the left femoral and the blood allowed to flow through the canula into a tall glass graduate of moderately small caliber. After about 25 or 30 c.c. had flowed out and the current of blood was running smoothly and evenly, readings were begun in order

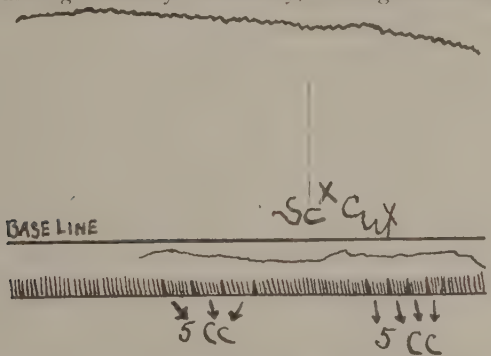

Fig. 1.—Tracing indicating outflow of blood in experiment on Dog 3. Moderate blood pressure. No evidence of shock. Division of sciatic (at ×) followed by more rapid outflow of blood from femoral vein. Time markings, 1 second.

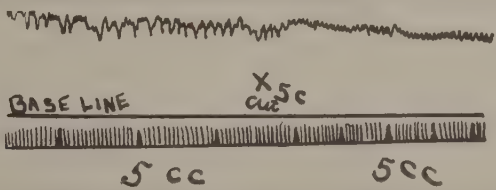

Fig. 2.—Tracing indicating outflow of blood in experiment on Dog 3. Very low blood pressure. Animal in profound shock approaching *exitus lethalis*. Division of sciatic (×) followed by a proportionately more rapid outflow from femoral vein than in Fig. 1. Time markings, 1 second.

to note the rapidity of the flow. The method of making these readings was as follows: At the moment the reading was begun an electric button connected with the second-time marker was pushed. After 5 c.c. of blood had flowed the button was pushed again, and this was repeated at the completion of the flow of each fifth cubic centimeter of blood until the time record on the drum showed four or five periods, each one representing the time flow for 5 c.c. of blood. Then the left sciatic nerve was severed and, after waiting a short while for the flow to steady, the time flow for 5 c.c. was recorded several times. The animal was then reduced by a state of shock, by manipulation and chilling of the abdominal viscera, and after the blood pressure showed a permanent fall the blood flow was measured from the right femoral vein, just as it had been from the left one, before and after section of the right sciatic nerve.

The vast majority of vasomotor impulses that reach the blood vessels

of the hind leg of a dog travel through the sciatic nerve; therefore, as is well known, severance of this nerve results in vasodilation in the extremity, and consequently in a more rapid flow of blood from the femoral vein. This point is illustrated by the tracing shown in Figure 1. Before the sciatic was cut it took seven seconds for 5 c.c. of blood to flow out, whereas after the sciatic was divided the same quantity of blood flowed out in five seconds. The crux of these experiments lay in the rate of outflow after the animal was reduced to a state of shock, for if in profound shock the vessels are beyond the control of the vasomotor centers, then severence of the sciatic nerve ought not to make any appreciable difference in the rate of flow. All our experiments showed that the proportional rate of flow from the vein was more rapid after division of the sciatic in a shocked animal than it has been from the opposite veins before the animal had entered the state of shock. Figure 2 is a continuation of the tracing shown in Figure 1, taken from Dog 3 of our series. This portion of the tracing represents a period when the animal was in a profound degree of shock. It will be noted that before the sciatic was divided it took nineteen seconds for 5 c.c. of blood to flow, whereas after section of the nerve it required only eleven seconds. This shows that the intact sciatic must have been transmitting impulses that were maintaining vascular tone. More than this, the proportionately more rapid flow* can not be due to an actually greater dilatation of the vessels in one instance than in the other, because in both instances we have a maximal dilatation consequent on severance of the nerve. It must be due to the fact that during shock the vessels (arterioles and capillaries) are more contracted than they are before the animal shows the effects of trauma. It must be borne in mind clearly that these experiments do not show anything more than that the division of the sciatic nerve of a shocked animal causes dilatation of the vessels of the leg, just as it does in a normal animal. This dilatation, however, is proportionately greater than that which occurs in the normal animal, and this proportional difference must be referred to the fact that in the shocked animal, before division of the sciatic, the vessels are in a state of greater contraction than they are in the normal animal.

Two reasonable objections may be made to our results, on the ground, first, that the time measurements were not accurate in the strictest scientific sense, and, second, that the anterior crural nerve was not severed so as to cut off all possible vasomotor impulses to the leg. As regards time measurements, they were not taken automatically and were, therefore, not true to a fraction of a second. Repeated experiments, however, demonstrated that this source of error was minimal, and, furthermore, our object was not to measure the exact time rate. We did not sever the anterior crural, because we found this procedure to be unnecessary. Our object was not to cut off all impulses, but to block out most of them.

*In the normal animal, the rate of flow before and after division of the sciatic was 7 to 5, whereas in the shocked animal the rate was 19 to 11. These two sets of figures demonstrate a proportionately more rapid outflow in the shocked animal.

The task now remains to confirm by visual inspection the statement that the peripheral vessels are contracted. For reasons already stated, we selected the retina as our field for this part of our work, and we are indebted to Dr. John Green, Jr., for our ophthalmic reports. Unfortunately, we failed in efforts to devise a scheme for measuring, with absolute accuracy, the diameters of the retinal vessels. In order that Dr. Green might not be prejudiced by the facts already secured by us, he was not told about them, being merely requested to examine the fundi of the dogs' eyes, before and after shock was induced, and to note carefully the size of the vessels. He took the size of the optic disc as his standard and compared the size of the vessels with it. In every instance he reported that the vessels showed a marked degree of contraction after the animal was in shock. The vessels contracted down to from one-third to one-half of their size before shock.

Two observations were particularly interesting: In one case the dog died immediately after an examination of the fundus which had disclosed marked contraction of the vessels, thereby demonstrating that vasoconstriction persisted up to the very point of *exitus lethalis*. Unfortunately, we neglected to examine any of the fundi after death in order to see if vascular relaxation occurred. The second observation of especial interest was a case in which the retinal vessels were contracted so tightly as to make them resemble mere strands. In this connection it is interesting to note that ophthalmic literature contains at least two reports[14] of sudden blindness occurring during shock, lasting from two to five hours, and then passing off without leaving any demonstrable eye changes or disturbances of vision. Roberts, who makes these reports, does not give the fundus findings during the state of shock, nor does he attempt to explain the cause of the blindness; but it seems fairly reasonable to assume that the occurrence of a sudden acute anemia of the retina, resulting from pronounced contraction of the retinal vessels, might cause transient blindness.

In conclusion it is important again to emphasize the fact that the experimental work detailed in this paper is in no sense of the word to be taken as an explanation of the causative factor or factors of shock. Just as Porter claims to show explicitly that in shock the vasomotor center is not exhausted and, therefore, implicitly that the peripheral vessels are not paralyzed, so we try to show explicitly that the peripheral vessels are contracted, and implicitly that not all the vasomotor centers can be exhausted. The complexity of the vasomotor apparatus, with its multiplicity of centers, and the seemingly independent action of many of these centers, render it impossible to frame a satisfactory theory based on our results. This much may be said with assurance: If the work herein detailed stands the test of confirmation, then the doctrine that shock is due to vasomotor exhaustion must be revised.

14. Roberts, W. O.; Am. Pract. and News, 1907, p. 24.

Note.—A complete bibliography of Shock up to 1886 may be found in G. H. Ghroeninger's "Ueber den Shock," Wiesbaden, 1885, from which we have quoted freely in the opening paragraphs.

EMPYEMA.*

By J. W. Holliday, M. D., Tarkio, Mo.

This term is applied to a collection of pus in any cavity, but by common consent, unless some other cavity is specified, it is understood to refer to that of the pleura. Pus may be found here as the result of the same causes that bring about serous effusion, plus the contamination by organisms from the lungs or more remotely through the systemic circulation.

In cases of penetrating injury of the pleura, when air has entered this cavity it is not unlikely that collections of blood or serum will become thus directly contaminated and empyema be the result almost from the outset. As a rule, however, it is the result, perhaps the termination of a chronic process. In recent cases the pleura does not have time to become very much thickened; but in long-standing cases, especially those in which spontaneous perforation has occurred, the pleura becomes infiltrated and altered, so as to lose all resemblance to its original structure, and to be found sometimes almost 2-5 of inch thick. Under these conditions it is more like leather than like living tissue. A collection of pus having occurred within the pleural cavity from any cause, several possibilities exist: Its fluid portion may be gradually absorbed and its solid material remain to cement the pleural surfaces together and to caseate and finally to disappear; or it may excite further production of fluid of the same character which will produce such urgent symptoms as to necessitate relief; or it may evacuate itself either by rupture into a bronchus or bronchiole and escape by the mouth or by perforation elsewhere in any one of various directions. Thus it has been known to burrow down around the external intercostal muscles which terminate under the intercostal cartilages and to appear at various points about the thorax, or to perforate or burrow around the fibers of the diaphragm and cause, perhaps, a subdiaphragmatic abscess, or to take some other unusual course.

It has, for instance, been known to perforate behind the mammary gland, and, pushing itself forward, to assume enormous size as a retromammary abscess; or to separate the diaphragm, and then the peritoneum, and to make such a dissection of it from the abdominal wall as to appear in the pelvis and in the abdominal wall as an enormous extraperitoneal abscess. But these are unusual cases, and it ordinarily gives rise to the same character of disturbance as a collection of serous fluid, with the addition of the constitutional signs of the presence of pus, such as chills,

*Read before the Atchison County Medical Society, April 22, 1909.

irregular high temperature, emaciation, hectic fever, etc. For the production of an empyema the pus-producing microbes must be present. The inflammation may be purulent from the start or a pleurisy with effusion may be converted into an empyema by the addition of pyogenic bacteria. The pus in empyema is not made up simply from the white blood-cells which have come through the walls of the blood-vessels by diapedesis, for their numbers are far too great for that to be possible. These cells undoubtedly subdivide rapidly after escape from the blood-vessels. In enumerating the etiological factors of empyema we cannot do better than to say that they are much the same as those mentioned under pleurisy with effusion, the empyema being simply a further stage in the same process, whether the pus be produced from the start as a result of infection with pyogenic organisms or whether it be due to a later infection engrafted on a sero-fibrinous exudation (diplococcus pneumonia). This germ is found in a large proportion of meta-pneumonic empyemas. We find about 75 per cent. of the purulent pleurisies of meta-pneumonic character in children. This germ is short-lived and is not very virulent, hence most of the empyemas in children are more easily cured than is empyema in adults. It is found in a certain number of cases of empyema where no lung lesion can be discovered. This does not, however, rule out absolutely the evidence of a previous pneumonic process, for in children—a class in which a large proportion of these cases are found—a central pneumonic process not easily diagnosed often occurs. This has doubtless been the case in many instances and the presence of the pneumococcus is the only guide to the etiological factor. The aphorism, "as a man thinketh in his heart so is he," not only embraces the whole of a man's being, but is so comprehensive as to reach out to every condition and circumstance of his life. Therefore I may say the exact route taken by this germ on its way to the pleura has not as yet been clearly proven; the lymphatics, the lung-tissue, or blood-current may be the route chosen. There is nothing unreasonable in the assertion that the germ may travel into the pleura and there set up a pleurisy without causing any pneumonia along its path. The pleural membranes may happen to be a more suitable soil for its development at that time than is the pulmonary tissue. This bacillus is found in about one-third of all cases of empyema. It often, but not invariably, produces a thick, viscid pus of greenish tinge. Pleurisy is practically always due to an infection by some microörganism. In a large number of cases it arises as the result of an invasion of the lung by the pneumococcus, with or without an associated pneumonia. In other instances it is due to the entrance of pyogenic organisms such as the staphylococcus and streptococcus, and in still other cases from invasion by tubercle bacilli. There is another process by which infection of the pleura may also take place through the pericardium, the mediastinal tissue, the vertebræ, and the diaphragm. When empyema follows pleurisy the necessity of setting free the pus enables us to determine the character of the infection in the great ma-

jority of cases and gives us some conception of the relative frequency with which pleurisy follows infection by different organisms. These loculated effusions are more common in cases of empyema than in ordinary cases of pleurisy with effusion. Empyema, like pleurisy, has its sequel and I believe most cases are secondary and not primary. Pleurisy occurs most frequently in the early spring and autumn when great changes in temperature take place. This does not mean that exposure to cold produces pleurisy directly, but rather that the exposure reduces vital resistence to such an extent that infection takes place. I think beyond a doubt that some form of pleural effusion is the primary factor by which the majority of cases of empyema ensues. It was taught at one time that such an effusion might primarily be serous and by infection become purulent, but at present this view is not generally held.

Empyema occurs as a sequel to infection from the lung in the great majority of cases, but it may arise from primary infection of the pleura. The condition is far more common in children than in adults. In children it is generally the result of the presence of pneumococcus, which commonly causes a bronchopneumona or a croupous pneumonia first and an empyema afterward, but in adults the streptococcus is usually the exciting cause. The infection may by the tuberculosis bacillus and it is a fact worthy of note that the pus in such cases is usually sterile, only revealing the presence of tubercle bacilli, when some of the exudate which lines the pleura is obtained through the aspirator. In other words, sterile pus from an empyema raises a suspicion of tuberculous infection. When no pulmonary lesion can be discovered in a case of empyema, it must be recalled that a very small and insignificant lesion in the lung and, therefore, one which is easily overlooked, may be the focus for a very severe pleural infection, and, therefore, the inability of the physician to find a primary pneumonic lesion does not prove that it has not existed.

The character of the pus in empyema varies considerably in different cases, the variation depending in part upon the microörganism which has produced the condition; usually it is creamy, in other cases it is thin and separates on standing into a thick and thin layer. When the effusion is an old one the pus may be quite thick and curdled in its appearance, containing clot-like masses or shreds of fibrin which plug the aspirating needle and make aspiration impossible. While the color is commonly a creamy yellow, it is sometimes slightly pinkish in appearance, and may be greenish in hue, and in other cases, when a considerable amount of blood has been extravasated into the effusion, it is a dirty, pale cocoa color. We find in a majority of cases due to infection by the pneumococcus, the pus is almost odorless, while in others, particularly if the empyema has ruptured into a bronchus, it is fetid. Purulent effusions in the pleural spaces are usually profuse, but as a rule I do not believe as large as serous effusions; on the other hand, they are very much more likely than are serous effusions to be walled off and encysted by reason of adhesions, thereby forming a small pocket of pus. The chief

complications of empyema are sepsis and perforation. The signs of sepsis are similar in this state to those produced by accumulation of pus elsewhere, and require no further attention. The differentiation of empyema from serous effusion is to be made by the presence of the septic symptoms and by the use of an aspirating needle to determine the character of the fluid. The localized types are those which offer real difficulty in diagnosis, since the pus may be between two lobes of the lung, or at the base of the lung next the diaphragm, or be extended over a considerable area while very shallow; or again, the inflammatory process in the adjacent lung tissue causes the presence of the physical signs of consolidation of the lung or of large effusion, when in reality the purulent collection is a small one. Introduction of the aspirating needle may fail to reveal the presence of pus, because the instrument does not happen to exactly strike the purulent focus. When the pus is localized by adhesions in the neighborhood of the heart, this organ may be displaced by the pressure and transmit its impulse to the effusion; so giving rise to the belief that a purulent pericarditis is present; the absence of this more serious state being revealed only when the pus is set free.

Interlobar pleurisy with effusion. In such cases if the accumulation is pus, it may rupture into the bronchi and give rise to the belief the patient has true pulmonary abscess. Theory after theory has been advanced, has lived its day and has taken its place in formulating a part of modern superstititon. For it is true that the accepted theory of one generation becoming disproved theory of a later one still retains an influence which is a determining factor in the view and opinion of laymen long after scientific physicians have discarded it. I do not wish to give a rehearsing of the history of medicine. Hippocrates, Galen, Celsus and Harvey rest from their labors and their works follow them. If we may credit the story which has descended from mythological times, the operation for empyema had its origin in an accident. It is related that a certain Phalereus, who was attacked with what was denominated as ulcer on the lungs, was pronounced by all his physicians to have an incurable disease. In his despair he exposed himself in battle so that he might be slain. The enemy's weapon, however, pierced his side, making an opening through which the pus escaped, and he recovered. This opened the field for which many plans and methods for operating on empyema. Hippocrates' operations were made by boring through the rib. So impressed were the disciples of Hippocrates by this view that they adopted the operation of perforating a rib instead of cutting through the intercostal space, because they could with more ease stop up the orifice and regulate the outward flow of the fluid. And if a hemorrhage ensued they could control it by plugging the hole. The evolution of the doctor has been slow and gradual, but almost constantly progressive. He has groped in the dark and guessed. He has struggled upward to the light and found it. He has received the command, know thyself; and has responded, I will; and neither time nor decay can destroy the structure

of exact knowledge and fact which he has built to the glory of God and the benefit of his fellow-beings.

The very fact that the profession is a product of evolution leaves for it only two conditions, progress or degeneration. There is, besides these, no alternative. If the medical profession of Missouri chooses to stand still, to cease the struggle for advancement along every line, the moment such a choice is made by an inevitable law of evolution, at that moment degeneration begins, and we shall become a withered member of our societies, national and international. If, on the other hand, we struggle for the attainment of the highest ideals, just as certainly, by the power of unchangeable law, we shall become strong and the other members of the great body of medical men at home and abroad will glory in our strength and development.

ASTASIA-ABASIA. REPORT OF A CASE.*

By J. D. Brummall, M. D., Salisbury, Mo.

The rarity of these cases and the likelihood of their being overlooked by the general practitioner, are my reasons for reporting this case.

Astasia-abasia is not a disease *sui generis*. The phenomena are thus far inexplainable in the absence of discoverable lesions. It is a functional neurosis and is closely allied to hysteria. P. Blocq first described astasia in 1888, as being an inability to stand, contrasted with integrity of sensation, muscular strength, and coördination of other movements of the legs. Abasia is a difficulty in starting the act of walking from a state of previous rest. This is a disease of adults and occurs equally frequent in men and women.

The symptoms consist either in a tendency to fall when standing upright or attempting to walk, or of great difficulty in locomotion, the body swaying or making various contortions to maintain the balance, while the patient grasps eagerly at any possible support and exhibits every manifestation of fear. In some cases the upright position, and especially walking, is impossible. If the patient is lifted up and supported on either side, the legs hang powerless. This same patient, however, when lying in bed, shows neither loss of power nor incoördination, and is perfectly able to crawl on the hands and knees and handle the limbs in any way. Some patients will be able to stand, if supported on either side, and still others may have limited or difficult locomotion, dragging the feet in short steps with irregularity and deviations. In this degree the patient may remain standing, but from time to time will exhibit a sudden giving-way of the legs followed by equally sudden recoveries. Closing the eyes usually increases the difficulty, but sometimes improves it. If the patient will attempt to walk cross-legged or backwards, the normal gait may be temporarily restored. In the unconscious variety the patient is without any idea that he cannot stand or walk, when he suddenly finds that he cannot do either. Another variety of astasia-abasia is the "hypochrondriacal," in which the patient acts under "conscious" erroneous impressions that he cannot walk or stand. A third form is associated with some suddenly acting shock, as fright, which acts inhibitorily on the motions of the patient. Finally there is a "coercion" variety of astasia-abasia in which the patient, while in the act of walking or standing, is suddenly seized with the idea that he cannot walk or shall not walk. This differs from the hypochondrical form in that the patient

*Read before the North Missouri Medical Association, Moberly, June 17-18, 1909.

is conscious of the erroneousness and absurdity of the idea, but is nevertheless controlled by it.

These forms are not always sharply defined. Suddenness is especially characteristic in the unconscious form. In other cases the patient may walk a few steps and suddenly break down; sometimes he stands as if rooted to the ground.

The diagnosis is based upon the retention of absolute integrity of sensation, of muscular strength and coördination of the legs demonstrable in the recumbent position.

The case I had was a lady of thirty-five years, somewhat of a nervous temperament, yet she was well nourished, bright of mind and looked the picture of health. She was seemingly happily married; husband prospering. She has two children, ten and thirteen years old. Labors were ordinary. She has not been sick since that and has only complained a few days at a time from any cause. She began to complain last January of soreness of the feet, limbs, hip and back and walked with difficulty. She slept well, ate well, looked and felt well, with the above exception. Her trouble was thought to be rheumatism and she used the ordinary remedies, both internal and external, without benefit. On seeing another doctor she was told that she had spinal sclerosis and to the other symptoms was then added a sore and swollen spot at one side of the spine in the lumbar region. She was put to bed, massaged and given potas. iodid for four weeks, with slight improvement.

Up to this time I had not seen the case, so the history I have given above is hearsay. At this juncture she fell under my observation. She looked the picture of health, ate and slept well. The tender spot on her spine could still be found by pressure and she had an irregular, wobbling gait, with sudden drops and catches in her steps. Muscular coördination was perfect in the recumbent position. Pain in limbs and back only on effort to stand or walk, soreness in them something like a myositis. Kidney and all secretions normal.

Four weeks of absolute rest in bed, away from family and friends, with good diet, some massage, and suggestive treatment, very much improved the condition and she has so continued since returning home.

This trouble being a functional neurosis and so nearly akin to and often accompanied by hysteria, the same treatment applies. They recover more quickly and are not so apt to a recurrence as in hysteria; yet some cases are quite obstinate.

REPORT OF A CASE OF DRY GANGRENE.

By G. W. Whiteley, M. D., Albany, Mo.

I was called on December 1st, 1906, to see Mrs. F., aged 86; found her suffering from a severe attack of influenza, fever 103° F., low, muttering delirium, which lasted for three days, fever dropping on second day to normal. On the night of the third day she became a raving maniac, the mania lasting from the third day, Tuesday, until the next Sunday morning at 3 a. m. No sleep in the interim, but she dropped into a light sleep and gradually fell into a profound slumber by 4 a. m. Sunday, which lasted until 8 a. m. She awakened in bright spirits and called for friends and breakfast, not realizing the time that had passed (some ten days) and believing only a night had gone by since her attack. She had no more mania, but I watched my patient closely, knowing that following such attacks one may expect sudden demise from blood clot, causing apoplexy. The following Tuesday she called my attention to her left forearm and hand when I visited her in the morning, and told me that when she awoke at six o'clock that morning she found her arm and hand paralyzed. Examining it I found a clot of blood had passed into the subclavian artery and lodged at the bifurcation of the ulna branch or above it, completely cutting off the circulation below. Watching closely I succeeded in about ten days in getting a feeble pulse in the ulnar artery and in fifteen days the radial pulse was discernible; demarcation was complete just above the second phatangeal joints of fingers, and palmar side of thumb and little finger of hand were attacked, as well as a patch, some four inches above the hand, 3 inches long by 2 inches wide. In about thirty days I removed all of the fingers and thumb above the second joints and also the palm of hand, the patient watching me. In eighty days she was completely recovered as to healing and could use the stub of hand very well. She is now living in Carthage, enjoying good health. If this condition had been in a young person, I would have removed or amputated the arm and no doubt would have lost my patient, but being old and enfeebled, I began a radical treatment and succeeded in saving my patient's life. The treatment was as follows: Three triple arsenate pills three times a day after eating; two grains brown iodide of lime every three hours; 20 gtts. echinacea (fl. ext. of the green drug) four times a day; ten 1-10 gr. calomel tablets every third day with saline every morning; bathing the hand in hot water three times a day and using the following lotion after:

Bal. fir.
Oil of cedar.
Oil of sassafras.
Chloroformi, āā .....dr. i
Alcohol, q. s. ft.....oz. iv

Watched the kidneys and kept them active with an occasional dose of arbutin. I have never heard of such a case recovering, except when an operation was performed, and only very few of them.

Journal
Missouri State Medical Association.

The Official Organ of the State Association and Affiliated County Societies.
Published Monthly under the supervision of the Publishing Committee.

ADDRESS ALL COMMUNICATIONS TO METROPOLITAN BUILDING, ST. LOUIS, MO.

Volume VI. OCTOBER, 1909. Number 4.

E. J. GOODWIN, M. D., Editor.

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EDITORIAL

COUNTY SOCIETY REPORTS.

We want to make a special request upon county society secretaries to send reports of their meetings for publication in the JOURNAL. There can be no doubt about the value of these reports, not only to the members of the societies whose reports are published, but also to the other societies; for it is an encouraging stimulus to the members of one society to learn of the work done in other societies. Thus the methods that have contributed most largely to the success of the meetings of one society may be imitated by others, and the mistakes avoided. The columns devoted to the reports of county societies should constitute a bureau of information, analysis, and suggestion as regards the means and methods for making the county meetings attractive, interesting and successful. The cultivation of closer personal acquaintanceship should not be overlooked and social meetings should be held at suitable intervals; and that there is much to commend such diversion from the regular routine of scientific work, is emphasized in the report of the Macon County Medical Society in the September issue.

One of the most important phases of county society work, with respect to the scientific proceedings, is the study of the post-graduate course. Quite a number of county societies have recently adopted this course as a part of the regular proceedings of each meeting, and its value was at once apparent. In commenting upon the beneficial influence of the post-graduate course, after its adoption by his society, the secretary of

Macon County Society says: "Our society is doing the most satisfactory work it has ever done, and we heartily commend the plan to other county societies of taking up the various organs and studying them for a period, as it stimulates study and increases interest;" and the secretary of Henry County quotes one of the members of a committee appointed to suggest a plan for the study of post-graduate work in Henry County Society, as having been surprised and pleased to observe how much could be accomplished by application and study upon one subject for two weeks. In St. Joseph the society has set aside certain hours for the study of the post-graduate course, and has purchased a stereopticon outfit to be used in connection with the work.

Perhaps it is well to remind the members that the State Anatomical Board will furnish sections of anatomical material for use in this scientific study. Those who wish to obtain material for this purpose should address Dr. C. M. Jackson, secretary of the board, Columbia

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EXTENDING KNOWLEDGE OF HYGIENE AND SANITATION.

The Public Health Education Committee of the American Medical Association, appointed by the House of Delegates at Atlantic City last June, has already begun an active campaign in the matter of popularizing knowledge of hygiene and sanitation. This committee is composed entirely of women physicians, members of the A. M. A., and aims "to disseminate accurate information concerning the nature and prevention of disease." To this end it plans to interest women's clubs, social settlements and girls' schools and colleges, in the broad and vital subject of right living—*i. e.*, preventive medicine—by means of popular lectures.

Dr. Rosalie Slaughter Morton, of New York, is chairman of the committee, and Dr. Evelyn Garrigue, also of New York, is the general secretary. A state secretary has been appointed in each state, who will be responsible for the work in her individual state. Missouri plans a health day for every women's club in the State, at which time such subjects as the following will be presented: Antituberculosis Work, Pure Milk and Infant Hygiene, Medical Inspection of Schools, The Cause and Prevention of Colds, etc.

Dr. Mary H. McLean, 4439 Delmar avenue, St. Louis, is secretary for St. Louis, and Dr. Frances L. Bishop, 4271 Washington avenue, St. Louis, is State secretary.

ONE JOURNAL FOR THREE ASSOCIATIONS.

The medical associations of the States of Washington, Idaho and Oregon have jointly assumed control of *Northwest Medicine,* formerly the official organ of the State Association of Washington. The journal appears in neat form, being of the size of 8½ by 12 inches, instead of 6¼ by 9¼ as formerly published. The larger form has many advantages over the smaller size and its adoption might perhaps form a proper subject for discussion by other state associations now publishing journals of smaller size.

The method of publishing the proceedings of several associations in a journal owned jointly by all the organizations participating in its conduct, seems a happy solution of a problem that has confronted the profession of those states where the numerical strength of the organizations is so small that the publication of the proceedings in journal form would be unprofitable, and constitute a burden too great for the associations to bear, or, if undertaken, would limit its influence through irregularity of issue and inadequate preparation. When several associations join in the publishing of a journal there would be sufficient financial support for the project, to permit the employment of a qualified person to give the proper amount of time and attention to the routine work necessary for preparing and issuing the journal in acceptable form, without interfering with the professional labors of the editor, whose time is already fully occupied.

Northwest Medicine is one of the best edited and most carefully conducted of the state journals, and we congratulate the members of the associations controlling it in possessing such a splendid medium for the publication of their proceedings.

PERSONAL AND NEWS NOTES

Dr. E. J. Logan, of St. Joseph, has returned from a ten weeks trip abroad. Dr. Logan was a delegate to the International Medical Congress at Budapest.

Dr. William F. Kuhn, formerly superintendent of the Insane Hospital at St. Joseph, has moved to Kansas City, where he will limit his practice to mental and nervous diseases. He has offices in the Shukert Building.

Dr. E. A. Derwent, of Clinton, has gone to London, where he will spend some months studying ophthalmology in the Royal Ophthalmological Hospital and other similar institutions.

Dr. W. A. McCandless has resigned as chief surgeon of St. Mary's Hospital, St. Louis. The surgical work of the hospital will hereafter be under the charge of two surgeons, and Drs. John McH. Dean and Louis Rassieur have been appointed to the positions.

Dr. E. W. Schauffler, of Kansas City, has been appointed medical director of the Jackson County Society for the Prevention of Tuberculosis. The society has established pavilions on the grounds of the old General Hospital and will begin active work in caring for consumptive persons and educating the people in the means of preventing the spread of the disease.

The Southwest Missouri Medical Society will meet in Springfield, November 4 and 5. Dr. H. S. Hill, of Springfield, is secretary, to whom all letters pertaining to program should be addressed.

The St. Louis University has established a new department for post-graduate instruction in ethics and psychology. The courses are designed for the students in the medical and law colleges. The Rev. Father Matthew McMenanny will have charge of this department, assisted by Rev. Father William F. Robinson.

The Physicians of Higginsville are working in harmony with each other in the interests of improvement of facilities relating to the better practice of medicine. It is believed that in a short time they will have an emergency hospital of which any small city may well feel proud. Interest is being brought to bear on the citizens of the town, and the time for completing the organization of such an institution appears to be near at hand.

Medical Defense in Michigan. The Michigan State Medical Society has adopted the plan of defending its members against suits for malpractice. The by-laws were amended so as to provide for an initial assessment of $1.50 from each member of the Association for the year 1910, and an annual assessment thereafter of $1.00 per year. Some objections were raised against the plan, but we believe these will disappear. The benefits to the members are fully understood and the practical application of the system will clearly demonstrate its importance, both as a protection against and a preventive of malpractice suits.

The Antituberculous commission of the Greene County Medical Society has started an active campaign toward the organization of a vigorous antituberculosis association in Springfield. Many prominent people in the State have manifested their interest in this work and the Medical Society is greatly encouraged in its efforts to restrict the spread of the disease and establish suitable quarters for the proper care and treatment of those already afflicted.

The St. Louis Municipal Commission on Tuberculosis has had numerous meetings during the past month at various public places where lectures, stereopticon views, and other methods of demonstrating simple measures for the prevention of the spread of tuberculosis, were brought to the notice of the people. The Commission is working systematically and effectively in spreading knowledge among the people of the best means of preventing tuberculosis and how to care for those who are afflicted.

The Physicians of St. Joseph have endorsed the new charter to be voted on for adoption, and have approved a provision to establish the board of health upon broader lines than at present obtains. The board of health of St. Joseph is now a committee of the city council, but under the new charter it will be an independent body, appointed by the mayor and at least one member must be a physician.

The American Association of Obstetricians and Gynecologists closed an interesting session at Fort Wayne, September 23d. The following St. Louis doctors read papers: Dr. W. B. Dorsett, on the subject of "Calcareous Degeneration of the Fibroid Uterus;" Dr. W. C. G. Kirchner, "Ovarian Pregnancy at Term;" Dr. Ernst Jonas on the subject of "Advantage of the Combined Intraperitoneal and Extraperitoneal Urethro-Lithotomy for Removal of Stones from Lower Ureter." Dr. John Young Brown performed several operations at a clinic.

OBITUARY

WILLIAM FRANCIS MITCHELL, M. D.

Dr. W. F. Mitchell, of Lancaster, Schuyler County, died at his home September 11th, 1909. Dr. Mitchell was a native of Missouri, having been born on a farm near Lancaster on September 22d, 1842. He attended the schools of the county and also a private academy in Lancaster and later attended Shurtleff College. Toward the close of the Civil War he served in the Federal Army for several months. After the termination of the war, he took up the study of medicine, serving, as in those days, under his preceptor, Dr. W. L. Lamber, of Lancaster. He graduated at Ann Arbor in 1868 and later took post-graduate courses at Chicago and New York. Soon after his graduation he returned to his home at Lancaster and practiced his profession in that locality continuously until his death.

He was a member of the Schuyler County Medical Society, Missouri State Medical Association, American Medical Association, American Public Health Association, surgeon for the Keokuk and Western Railway, and U. S. pension examining surgeon from 1885 to 1895.

Dr. Mitchell possessed a peculiar adaptability for his profession, and his life was filled with the good deeds which endeared him to every family he served.

HENRY THORNTON, M. D.

Dr. Henry Thornton, of Maplewood, Mo., committed suicide at his home on September 12th. Dr. Thornton graduated from the Barnes Medical College in 1901 and immediately afterwards moved to Pittsburg, Texas, where he practiced for several years. About two years ago he returned to Missouri and located in Maplewood.

JUSTIN STEER, M. D.

Dr. Justin Steer, of St. Louis, died at his home on June 20th, from the effects of poison self-administered, while under a mental strain due to his belief that he had an incurable affection of the heart. He was 60 years old. He graduated from Washington University and at the time of his death he was a member of the medical faculty of that institution.

Dr. Steer's character was marked by many qualities which are worthy of mention. He was modest and unassuming, just and upright; he was not only a student of disease but of human nature. And with these attributes was combined the patience so necessary to success in the practice of medicine. Of his medical career his thoroughness, evidenced in the correctness of his diagnoses, was an outstanding quality that was recognized by all his confrères. His opinion in diseases of the heart

and lungs was always so weighty that it never invited any other criticism but the favorable remark that meant that his judgment must be sound enough to pass unquestioned. By the death of so valued a member of the medical profession, the ranks of the men who are noted for their calm and collected thought, the sanity of their opinions and the continuous desire to improve their knowledge, have been robbed of no secondary ornament.

WILLIS P. KING, M. D.

Dr. Willis P. King, of Kansas City, died at his home on July 13th. Dr. King had been confined to his bed for several months and gradually passed away from the effects of uremia. He was born in Macon County, Mo., December 21, 1839, and graduated in medicine from the St. Louis Medical College in 1866. Later he went East and took post-graduate courses in Bellevue College and the New York Polyclinic.

Dr. King rose to high eminence in the practice of his profession and was also a conspicuous figure in political and social circles in Missouri. Out of his many experiences as a practitioner in country districts, Dr. King wrote the "Stories of a Country Doctor."

COUNTY SOCIETY NOTES

CLINTON COUNTY MEDICAL SOCIETY.

The Clinton County Medical Society held its regularly quarterly meeting on Tuesday, September 7th.

While the inclement weather kept many members away, every member on the program was present and read an excellent paper. The papers were discussed by all present with vim and enthusiasm.

The following program was rendered: "Injuries and Ailments Following Labor," by Dr. G. B. Rush. "Gelsemium," by Dr. J. T. Kimsey, of Lathrop. "Embryonal and Foetal Pathology," by Dr. M. L. Peters, of Cameron. "Side Issues that the Obstetrician Meets," by Dr. C. M. McConkey. "The Doctor as a Fool Killer," by Dr. A. W. Robertson.

Dr. A. W. McAlester, Jr., of Kansas City, was with us and gave us an excellent talk on "What the Component County Society Means to the State and Nation." The talk was full of good thought and excellent truths for us and we certainly appreciated his coming.

The next meeting will be an open meeting with a night session at Lathrop, on October 26th.—C. M. McConkey, M. D., President.

HENRY COUNTY MEDICAL SOCIETY.

The Henry County Medical Society met in Windsor, on Wednesday, September 15th. Members present: Drs. Gibbins, Haire, McNees, Blackmore, Head, Jennings, Griffith and Douglass; Dr. F. J. Beattie, from Kansas City, and Drs. Shadburn and Wall, of Windsor, visitors by invitation.

Dr. R. J. Jennings read a paper on "Sources of Infection," going into the subject very thoroughly; he told how pathogenic macroparisites and microparisites occurred on skin and mucous membrane and in the different secretions and excretions of the body, how they were transmitted by animals, flies, mosquitoes, water and soil infection, how food was contaminated and the results. The paper was well read and was heartily approved and commended by all present.

Dr. Shadburn discussed some old theories concerning struma and scrofula, so-called diseases, now considered indications of tuberculosis. Before the days of bacteriology, the doctor waited for the frost to exterminate malaria and yellow fever, whereas now we know that the frost is effective only because it kills the mosquito, the carrier of the malaria and yellow fever germ.

Dr. Haire gave the new thought on tuberculosis as regards bovine virus and milk infection, promulgated by the International Congress on Tuberculosis.

Dr. T. J. Beattie, of Kansas City, read a report of cases to illustrate the manner of invasion of infection and how he treated such cases, confining himself to the pelvic viscera. This paper was very interesting

and instructive. It was discussed by Drs. Haire, Blackmore, McNees, Gibbins and Jennings.

Dr. Head reported a case of laceration of the perineum and described the operations in vogue for the repair of this condition. He pointed out the frequency of failure following operative measures and advised the use of a continuous suture in uniting the mucous membrane first and then sewing to the integument.

Dr. Griffith reported a case of depressed fracture of the temporal region, which he relieved by raising the bone that impinged upon the brain, with the loss of some brain substance. The patient made a complete recovery. He also reported a case of injury to the leg, in which the bones were so badly crushed that amputation was necessary. He dressed the stump with iodine solution and the patient made an excellent recovery.

Dr. Blackmore reported a case, a girl of 16 years, that terminated fatally, in which severe pain in the head was the most prominent symptom. He described all the symptoms, and the treatment he had followed, and asked the members for their opinion as to the cause of the condition. Opinion was divided between meningitis and cerebral hemorrhage.

The study of the post-graduate course is highly commended by all the members.—F. M. Douglass, M. D., Reporter.

HOWARD COUNTY MEDICAL SOCIETY.

The Howard County Medical Society met at Fayette, October 1st, in regular monthly session. Those present were: Drs. Wright, Lewis, Fleet, Bonham, Burgwin, Gallemore, Gentle and Watts.

Dr. Watts presented a case of sarcoma, concerning which he had previously informed the society, and reported the present condition of the patient.

Dr. Gentle presented a case of "adiposa dolorosa."

Dr. P. C. Megee reported a case of absence of the thyroid gland, which was treated by extirpation of the thyroid.

The case against the chiropractics was continued until the next term of court.—C. W. Watts, M. D., Secretary.

LAFAYETTE COUNTY MEDICAL SOCIETY.

The regular monthly meeting of the Lafayette County Medical Society met in the assembly room of the City Hall in Lexington, on the second Tuesday of July. Two sessions were held, one in the forenoon, for the purpose of disposing of the business that came before the meeting, and an afternoon session, which was devoted to the reading and discussion of scientific papers that were presented to the meeting.

The following program was arranged for the occasion, and some of the papers met with a free discussion by all the members:

"Our Physicians' Study Club," Dr. E. A. Hoefer. "Entero-Colitis," Dr. T. B. Payne. "Tetanus," Dr. W. A. Porter. Paper, selected, Dr. John Mann.

The following members, with Dr. Lewis M. Carthrae, the president, were present: Drs. Ryland, Roberts and Payne, of Lexington;

Drs. Ott and Hoefer, of Higginsville; Dr. Fischer, of Alma; Dr. Frank Mann, of Wellington.

Owing to a misunderstanding of the by-laws, relative to a permanent place of meeting, it was decided to have the next regular meeting of the society in Lexington on the second Tuesday of August.—E. A. Hoefer, M. D., Reporter.

MISSISSIPPI COUNTY MEDICAL SOCIETY.

The Mississippi County Medical Society met in regular session at Charleston, August 2d. Present, Drs. A. and S. P. Martin, of East Prairie; Drs. Lynch, Chapman, Howle, of Charleston. Visitors, Drs. John C. Boone and A. Marshall, of Charleston.

Dr. Lynch reported a case of tumor located in the right iliac region. The patient, a child of three years, was suffering at the time with an attack of whooping cough and the parents had given calomel a day or two previous to the doctor's visit. The patient when seen on the first day, had a temperature of 100° and a pulse of 100. The temperature remained between 100° and 102° and the pulse from 100 to 120, for 13 days. The tumor gradually disappeared under purgative doses of olive oil. The case was interesting because of its obscurity and the trouble in making a positive diagnosis. There was a history of possible traumatism, caused by a fall some two weeks before the doctor was called. The history, although complete as to size, location, consistency, duration and cessation of enlargement, was insufficient to make the diagnosis clear. Drs. Boone and Chapman thought it was appendicitis; Dr. Marshall also shared this opinion. Dr. Sam Martin thought it was intussusception. Drs. Lynch and Howle were not positive as to the trouble, but thought it could possibly be of traumatic origin.

The discussion of Dr. Lynch's case was free and comprehensive, showing interest in such cases.

Dr. Marshall reported a case of malarial constipation, in which the usual remedies were ineffectual.

Obscure cases were reported by Drs. Boone and Martin, showing that the diagnosis of iliac tumors is not always plain sailing, and that the typical symptoms of appendicitis are not always present in this affection, an exploratory incision often being necessary to complete the diagnosis.

The applications of Drs. Boone and Marshall for membership were referred to the proper committee.

The society adjourned to meet the first Monday in September.—W. P. Howle, M. D., Secretary.

WEBSTER COUNTY MEDICAL SOCIETY.

The Webster County Medical Society held its regular quarterly meeting at Rogersville, September 15th. Those present were Drs. M. Highfill, W. R. Beatie, Jno. R. Bruce, W. J. Rabenau, T. S. Bruton, E. Trimble, C. H. McHaffie, W. A. Atkins, B. T. Cantwell and A. H. Madry, of Aurora; also the District Councilor, and Dr J. S. Sayers, of Greene County.

Dr. B. T. Cantwell read a paper on "Insanity," dealing with the subject from the general practitioner's standpoint. He recommended isolation and diet or forced feeding in the treatment of such cases. The paper was discussed by quite a number of the doctors present.

Dr. A. A. Atkins reported a case of septicemia.

There was a general discussion on the treatment of typhoid, in the main of which the doctors were agreed.

Dr. A. H. Madry read a paper, entitled "The State's Duty to the Physician," which was well received by the members present, each promising to do his part towards educating the public and creating a sentiment in favor of the State recognizing the importance of the physician.

Adjourned to meet at Seymour in December.—W. R. Beatie, Secretary.

CORRESPONDENCE

To the Editor:

I would be very grateful if any of your readers would send me names or data or biographies of any dead medical worthies of your State for my forthcoming Cyclopedia American Medical Biography; doctors who have done good work outside their own profession in advancing science are also eligible. Above all, I want the man himself, not only dry facts. Yours faithfully,

Howard A. Kelly, M. D.,
1418 Eutaw Place, Baltimore, Md.

SPECIAL ARTICLE

SOCIETY PROCEEDINGS.

The nineteenth annual convention of the National Confederation of State Medical Examining and Licensing Boards met at Hotel Marlborough, Atlantic City, N. J., June 7, 1909.

Dr. Ravogli delivered his address on "The Necessity of a Practical Test for Candidates in the State Examinations."

The report of the Executive Council was read by the Chairman, Dr. N. R. Coleman. Acting upon the recommendations contained in this report, a committee of five, all of whom are members of state boards, was appointed to investigate and report at the succeeding meeting of the Confederation, on the subject of clinical instruction in medical colleges; and provision was made for the presentation of this subject by clinical teachers themselves. The Secretary of each of the state and territorial examining Boards, and of the District of Columbia, were appointed as a Committee of Official Correspondents of the Confederation.

Dr. N. P. Colwell read a paper on "The Need, Methods and Value of Medical College Inspection," following which the report on Standing of Medical Colleges was read by Dr. James A. Duncan.

Dr. J. C. Guernsey read the report of the Examinations Committee. This report was referred to the Executive Council for further consideration, and on the basis of recommendations contained therein the following resolution was adopted:

Whereas, A mixed examination, oral, practical and written, of applicants for medical licensure in every state is important, therefore be it

Resolved, That this Confederation earnestly recommends to the various state boards now restricted as to their methods of conducting examinations, to take proper steps to secure amendatory legislation to enable them so to conduct their examinations.

Under the head of Symposium on Examinations, the following papers were presented:

"Practical versus Theoretical Examinations," by Dr. W. T. Councilman. "The Inadequacy of the Written Examination," by Dr. Edwin B. Harvey. "What Branches or Portions of Branches Should be Included in the Written, and What in the Oral Examinations?" by Dr. J. C. Guernsey. "Is It to the Best Interests of Students and Medical Examining Boards to have Divided Examinations?" by Dr. William Warren Potter. "The Feasibility of Practical Examinations," by Dr. Augustus Korndoerfer. "How Can Practical Examinations be Graded and Recorded?" by Dr. L. F. Bennett.

Dr. M. G. Motter, as a part of the Secretary's annual report, reviewed briefly the work of the sub-committee on the Teaching of Materia Medica and Therapeutics of the Council on Medical Education, A. M. A. The recommendations contained in this report were referred to the Executive Council, and the following resolutions were finally adopted:

Whereas, It is generally recognized that the time available for in-

struction in Therapeutics, Materia Medica and Pharmacology does not suffice for the study of all the known drugs; and

Whereas, It is also recognized that but limited time can be devoted, to best advantage, to acquiring a thorough familiarity with the characters, actions and uses of the important drugs, at the expense of those of doubtful or negative value; therefore be it

Resolved, That the National Confederation of State Medical Examining and Licensing Boards urges upon its constituents the advisability of confining examination questions to the most important preparations of the more important drugs.

Resolved, That it recommends to their attention the report of the Sub-Committee on the Teaching of Materia Medica, etc., of the American Medical Association's Council on Medical Education; and be it further

Resolved, That the President of the National Confederation of State Medical Examining and Licensing Boards be, and he is hereby, authorized and instructed to appoint a committee of three to confer with the Council on Medical Education and to compile and report to this Confederation a list of the more important drugs and their preparations to which the examinations of the constituent boards may be confined, this list to be published in the *Journal* of the American Medical Association as with the approval and endorsement of the Confederation.

The Confederation adjourned to meet on the day preceding the annual convention of the American Medical Association in 1910, at St. Louis.

STATE BOARD QUESTIONS AT THE EXAMINATION FOR LICENSE TO PRACTICE MEDICINE, ST. LOUIS, JUNE 7, 8, 9, 1909.

ANATOMY.

(1) Give gross and minute anatomy of kidney.
(2) Describe minutely the pericardium.
(3) Give origin, ending, branches and relationship of posterior tibial artery.
(4) Describe the hip joint.
(5) Describe the humerus.
(6) Name all structures divided in amputation of thigh at middle third.
(7) Name and describe the second pair of cranial nerves.
(8) Give nerve and blood supply of stomach.
(9) Describe the popliteal space, giving contents.
(10) Name and locate sinuses of dura mater.

BACTERIOLOGY.

(1) What is meant by agglutination? Describe the technique of Widal's test.
(2) Describe the microscopic picture of the plasmodium malariæ of the tertian form.
(3) Describe one method of staining tubercle bacilli and describe the appearance of the bacilli under the microscope.
(4) Describe the tetanus bacillus and give the treatment for tetanus.
(5) Describe the Klebs-Loeffler bacillus and give the reasons for the use of the anti-diphtheritic serum in connection with infections by this bacillus.

CHEMISTRY.

(1) Give formula for magnesium sulphate. How manufactured.
(2) Give formula, tests and method of manufacturing chloroform.
(3) Give differential test for quinine and morphine.
(4) Give formula, method of manufacturing, and antidote of carbolic acid.
(5) Give chemical composition of gastric juice and percentage of each constituent.

GYNECOLOGY.

(1) Describe involution, subinvolution and inversion.
(2) Describe pruritus vulvæ. Give treatment.
(3) Define amenorrhœa, dysmenorrhœa.
(4) Give results of non-repair of lacerated perineum.
(5) Define menstruation.
(6) Describe cystocele and rectocele. Give treatment of each.

JURISPRUDENCE.

(1) What would be the post-mortem findings in a case of poisoning by illuminating gas? Give the method for making the examination.
(2) Give in general terms the present law governing the committing of an abortion. Give the relationship of the physician and the patient as regards their testimony in trials under this law.

(3) What are the essential points which must be covered in writing a will?

(4) What would be the post-mortem findings, and give the tests by which you would prove death by arsenic.

(5) What is the difference between the wound of entrance and the wound of exit in a perforating gunshot wound of the skull?

OBSTETRICS.

(1) Define post-partum hemorrhage. Give usual causes and treatment.

(2) What causes uterine inertia? Give treatment of same.

(3) Give symptoms of threatened abortion. Give treatment of same.

(4) Describe asphyxia of the new born. Give treatment.

(5) When would you administer ergot in labor? When use chloroform? Give dangers of each.

(6) Define hour-glass contraction. Give treatment.

(7) Differentiate hand from foot presentation. Give management of each.

(8) Give symptoms and treatment of extrauterine pregnancy.

(9) Describe version. Give forms and the indication for each.

(10) Describe the fœtal circulation.

(11) Give cause and treatment in prolapsed cord.

PATHOLOGY.

Give pathology in each of the following diseases:

(1) Tuberculous arthritis.

(2) Membranous laryngitis.

(3) Hodgkin's disease.

(4) Define a cyst. Name two principal modes of origin.

(5) Give pathological findings, post-mortem, in chronic alcoholism.

PHYSIOLOGY.

(1) What influence does the contraction and relaxation of the arterioles and arteries have upon the heart's action? Explain this contraction and relaxation.

(2) What is the pulse? What factors enter into its production?

(3) Describe the influence which the absence of the thyroid glands produces upon the general economy.

(4) Describe the composition of the gastric juice.

(5) Describe the formation of glycogen, and give its use in the animal economy.

(6) Describe the composition of the blood, and give, as far as it is understood, the function of each of the component elements.

(7) Describe the physiological properties of muscle tissue, and explain in detail the changes from the normal which occur in the muscular tissue of the heart in one disease of the heart.

(8) Describe the functions of the lymphatic system.

(9) Explain the rhythm of the respiratory movements.

(10) What is meant by muscular sensation, and what is meant by general sensibility.

PRACTICE.

Give etiology, symptoms and treatment in each of the following diseases:

(1) Cerebro-spinal meningitis.
(2) Catarrhal jaundice.
(3) Endocarditis.
(4) Bright's disease. (Acute.)
(5) Acute gastritis.
(6) How would you diagnose gall-stone colic? Give treatment.
(7) Name two forms of stomatitis; give etiology, symptoms and treatment of each form.
(8) Discuss membranous laryngitis.
(9) Discuss intestinal obstruction. (Not less than 200 words.)
(10) Give etiology, symptoms and treatment of paralysis agitans.

SURGERY.

(1) Given a case of acute osteomyelitis of the tibia in a child: What would be the clinical symptoms and what would be the treatment?
(2) Describe in detail the treatment of a case of open oblique fracture of the femur at the juncture of the middle with the lower third.
(3) Describe in detail the symptoms produced by a backward dislocation at the elbow, and a recognized method of treatment which is to be instituted from the time the patient is seen until he is discharged.
(4) Describe in detail the histologic changes in a case of epithelioma of the lower lip; give its clinical course and the recognized surgical treatment for this affection.
(5) Give the symptoms which are observed clinically in a case of tuberculosis of the glands of the neck in a child and describe the treatment.
(6) Differentiate a deep-seated abscess in the popliteal space from aneurysms of the popliteal artery.
(7) Describe the clinical symptoms and explain the causes for their occurrence in a case of acute appendicitis.
(8) Describe in detail the avenues through which a full bladder may be evacuated, and give the indications for choosing the various routes which you have described.
(9) What is a felon? Describe the symptoms which exist in this condition and treatment.
(10) Describe in detail Colles' fracture; give the symptoms which are observable when it exists; give the usual complications which follow unsuccessful primary reduction and give the treatment.

THERAPEUTICS.

(1) Give therapeutic action and dosage and indication for the use of belladonna, and preparations in common use.
(2) Give composition, use and dosage of magnesium sulphate and the common name.
(3) Give source, officinal preparations, therapeutic indications and dosage of ergot.
(4) Name the more important preparations of opium, and their physiological effect, with dosage.
(5) Name various silver salts used in therapeutics with method of use.
(6) Name four important mercurial preparations and their method of use.
(7) Give officinal preparations of aconite, with dosage of same.
(8) Give officinal uses and dose of colchicum.
(9) Name five important bromides, uses and dosage.
(10) Give the source, preparations and therapeutic indications for the use of chenopodium.

BOOK REVIEWS

PAIN. ITS CAUSATION AND DIAGNOSTIC SIGNIFICATION IN INTERNAL DISEASES. By Rudolph Schmidt, Assistant in the Clinic of Hofrat von Neusser of Vienna, Austria. Translated by Drs. Karl M. Vogel and Hans Zinsser. J. B. Lippincott Co., Philadelphia.

Unlike the many small volumes on large subjects, this one in particular, though of but 300 pages, in a most concise and excellent manner conveys much to the reader. Especially is this true in that part allotted to the Gastro-Intestinal Region, in which valuable information is given, brief and to the point.

Dr. Schmidt is known to most Americans who have attended the clinics at the Vienna General Hospital, and is regarded as a thorough, conscientious, hard worker; one can rest assured that earnest consideration has been given to every symptom of pain and signification that he has described.

PROGRESSIVE MEDICINE, VOL. III., SEPTEMBER, 1909. A Quarterly Digest of Advances, Discoveries and Improvements in the Medical and Surgical Sciences. Edited by Hobart Amory Hare, M. D., Professor of Therapeutics and Materia Medica in the Jefferson Medical College of Philadelphia. Octavo, 336 pages, with 37 engravings. Per annum, in four cloth-bound volumes, $9.00; in paper binding, $6.00, carriage paid to any address. Lea & Febiger, Publishers, Philadelphia and New York.

The September volume of Progressive Medicine deals helpfully with four topics of great practical importance. Dr. William Ewart contributes an article dealing with the literature on diseases of the thorax and its viscera, this article considering in detail all the latest advances in our knowledge of tuberculosis. Dr. Gottheil's contribution covers the literature on dermatologic subjects, including syphilis. The recent work in obstetrics is handled by Edward P. Davis, and the volume concludes with a review of the neurologic literature written by Dr. Spiller.

APPENDICITIS AND OTHER DISEASES OF THE VERMIFORM APPENDIX. By Howard A. Kelly, M. D., with 215 original illustrations; some in colors and three lithographic plates. Philadelphia and London. J. B. Lippincott Co. 1909.

The American profession is so well acquainted with this work that it would seem superfluous to outline here the scope of this most complete presentation of the protean diseases of the vermiform appendix. This new second edition has been thoroughly revised by its distinguished author because he has become convinced that a compact résumé dwelling with particular care on the practical side of the subject would better meet the

needs of the great army of general surgeons throughout the country. In its new form this volume on appendicitis represents the standard work of the world on this disease.

LEGAL MEDICINE AND TOXICOLOGY. By R. L. Emerson, A. B., M. D. New York and London. A. Appleton & Co., 1909.

The subject of legal medicine is one which is too little understood and appreciated by the general practitioner and medical student. This book has been written to fill the need for a single volume treating the subject from as practical a point of view as possible, and with special reference to the needs of the busy practitioner who suddenly finds himself confronted with a medico-legal case. In any such emergency, in our belief, this new work will afford immediate and thorough information.

THE TREATMENT OF FRACTURES: With Notes Upon a Few Common Dislocations. By Chas. L. Scudder, M. D., Surgeon to the Massachusetts General Hospital. Sixth Edition, Revised and Enlarged. Octavo volume of 635 pages, with 854 original illustrations. Philadelphia and London. W. B. Saunders Company, 1907. Polished buckram, $5.50 net; half morocco, $7.00 net.

This sixth edition on Fractures and Dislocations, is a most practical and useful book for the general practitioner, as well as for the surgeon. The methods of diagnosis and subsequent management of bone and joint injuries, as promulgated in this volume, are not surpassed by any other author. Its teachings are simple, logical and concise. It is a valuable book and should be in the library of every practitioner of medicine and surgery.

F. B. F.

A TEXT-BOOK OF SURGICAL ANATOMY. By William Francis Campbell, M. D., Professor of Anatomy at the Long Island College Hospital. Octavo of 675 pages, with 319 original illustrations. Philadelphia and London: W. B. Saunders Company, 1908. Cloth, $5.00 net; half morocco, $6.50 net.

Campbell's Surgical Anatomy is fortunate in bringing out the anatomic facts of special surgical interest. In the first chapter of surface anatomy the important anatomic landmarks are most beautifully shown in the cuts and description. The cuts throughout the work are remarkable for their clearness.

Among the most remarkable are those showing the cranial contents. These are so plain that one who is familiar with the principles of anatomy may read at a cursory glance.

Among other noticeable illustrations are those relating to the anatomy of the neck, the once forbidden ground of the surgeon, the most difficult part of the practical anatomy of the human body.

The practical surgery embodied in the work is up to date, concise, and so plain that he who runs may read.

This book should find a place in every doctor's library, whether he be surgeon or practitioner. It should hold the place in surgery that is held in medicine by Butler's Diagnostics of Internal Medicine.

N. F. T.

ARTICLES APPROVED BY THE COUNCIL ON PHARMACY AND CHEMISTRY.

SEXTONOL.

A mixture of tonols in tablets of 0.3 Gm. (5 grains), each tablet being said to contain lime tonol, 0.13 Gm. (2 grains); sodium tonol, 0.13 Gm. (2 grains); iron tonol, 0.00033 Gm. (1/200 grain).

Actions, Uses and Dosage.—See Glycerophosphates. Manufactured by Chemische Fabrik auf Actien, vorm E. Schering, Berlin (Schering & Glatz, New York).

SIDONAL.

Sidonal $\begin{matrix}/CH_2CH_2\backslash \\ NH.2C_6H_7(OH)_4(COOH) \\ \backslash CH_2CH_2/\end{matrix}$ $=C_{18}H_{24}N_2O_{12}$, is the normal salt of piperazine and quinic acid.

Actions and Uses.—Sidonal is recommended as a uric acid solvent in gout, neurasthenic, etc. Dosage.—1 to 1.3 Gm. (15 to 20 grains) 5 or 6 times a day, dissolved in water. Manufactured by Vereinigte Chemische Werke Actiengesellschaft, Charlottenburg (Victor Koechl & Co., New York).

SODIUM CACODYLATE.

Sodium cacodylate $(CH_3)_2AsO.ONa+3H_2O$, is the sodium compound of cacodylic acid $(CH_3)_2AsO.OH$, a dimethyl derivative of arsenic acid, $AsO(OH)_3$.

Actions and Uses.—The action of sodium cacodylate is similar to other arsenic compounds, but it is much less toxic than the ordinary preparations of arsenic and is also less apt to cause undesirable side effects. This superiority is due to the slow liberation of the arsenic ion in the body. The cacodylate si particularly recommended in obstinate psoriasis, pseudoleukemia, diabetes, anemia, chlorosis, tuberculosis, malarial cachexia, etc. Dosage.—0.025 to 12 Gm. (½ to 2 grains) in pills, hypodermically or by enema.

SODIUM CINNAMATE.

Sodium cinnamate, $C_6H_5.CH:COONa=NaC_9H_7O_2$, is the sodium salt of β-phenyl-acrylic (benzene-propenoic) acid, $C_6H_5CH:CH.COOH$.

Actions and Uses.—Balsam of Peru, cinnamic acid and sodium cinnamate are recommended by Landerer for the treatment of phthisis, the drugs being injected intravenously under strict aseptic precautions. The effect is referred by him to an inflammatory reaction, localized about the tuberculous foci and leading to cicatrizations. He records very favorable results in well-selected cases, and other clinicians have also reported some successes, although the treatment fails very often. The synthetic cinnamate is preferred on account of its purity. Dosage.—0.001 Gm. (1/60 grain), gradually increased to 0.02 Gm. (1/3 grain), in 1 to 5 per cent. solution, injected intravenously thrice weekly for long periods (3 to 18 months).

STYPTOL.

Styptol, $(C_{12}H_{13}O_3N)_2C_6H_4(COOH)_2$, is the normal phthalate of cotarnine, an oxidation product of narcotine, similar to hydrastinine.

Actions and Uses.—Its action resembles that of stypticin. Compounds with phthalic acid are said to have especial hemostatic properties. Styptol has been recommended in uterine hemorrhages. Dosage.—0.065 Gm. (1 grain) in sugar-coated tablets, 3 to 5 times daily. Manufactured by Knoll & Co., Ludwigshafen a. Rh. and New York.